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An Address
ON
X RAY THERAPY.

Delivered before the Hampstead Medical Society

BY ROBERT KNOX, M.D. EDIN., M.R.C.S., L.R.C.P.,
CONSULTING RADIOLOGIST, GREAT NORTHERN CENTRAL HOSPITAL; HONORARY RADIOLOGIST, KING'S COLLEGE HOSPITAL; DIRECTOR, ELECTRICAL AND RADIOTHERAPEUTIC DEPARTMENT, CANCER HOSPITAL (FREE) LONDON.

MR. PRESIDENT AND GENTLEMEN,—The proper appreciation of the value of radiations in practical therapeutics is, to those unacquainted with the subject, very difficult. Opinions vary amongst surgical and medical experts to an astonishing degree. Such opinions are sometimes expressed on scanty knowledge of the matter, especially of the technique and the action of radiations upon the tissues, and oftener on the results obtained in the treatment of quite unsuitable cases. Perhaps a still more confusing factor is presented by the conflicting opinions of experienced radiologists who may be over-enthusiastic in their claims for the efficacy of the agents they employ, and who may not have had a very extensive clinical knowledge of the diseases they are called upon to treat. Lastly, the new agents were quite early in their history called upon to cure diseases which had completely baffled all other known methods. Little wonder that the results should have been scanty, and that so many conflicting opinions on value have been formed and expressed.

In this paper I shall endeavour to give a summary of X ray therapeutics and describe the technique for a number of diseases which benefit from radiation treatment. It will be impossible to discuss the instrumentation or the physics of the subject. The former is best learned by a few visits to an X ray department. The latter calls for an extensive practical knowledge of physics.

THE X RAYS AND THE STRUCTURE OF MATTER.

The far-reaching effects of the discovery of X rays and the subsequent isolation of radium were at the outset hardly recognised. Kaye, in his introduction to his admirable book on X rays, says:—

"In the early nineties it was not infrequently maintained that the science of physics had put its house in complete order, and that any future advances could only be along the lines of precision measurement. Such pessimism has been utterly confounded by a sequence of discoveries since 1895 unparalleled in their fundamental nature and promise. Even many not specially concerned have had their attention directed to the recent attempts at solving the riddle which has excited interest and taxed ingenuity since the beginning of civilisation—the problem of the ultimate structure of matter.

The chemist and physicist have long built upon a theory of atoms and molecules, though information as to the existence and behaviour of individual atoms was only based on speculation, however justifiable.

But within the last decade we have not only isolated the atom but we have learnt a great deal about its internal structure. Radio-activity has, for example, introduced us to an electrically charged atom of helium (the α ray) with characteristics such that it can, in spite of its extreme smallness, make individual appeal to our senses.

The speed of the α rays is so abnormally high that, if, for instance, they are allowed to strike a fluorescent screen, as in the spinthariscope of Sir William Crookes, each atom possesses enough energy to record its arrival by a single flash of light. Rutherford and Geiger have actually recorded the arrival of atoms by means of a delicate electrometer. C. T. R. Wilson has succeeded in rendering visible and photographing the paths, not only of single charged atoms but of electrons and X rays as well.

These are interesting phenomena, and the closer study of their production and characteristics led to the further discovery of electrons by J. J. Thomson and of the X rays by Röntgen.

Through the efforts of a band of workers the Röntgen rays have thrown a search-light on many phases of atomic physics not susceptible to other methods of attack. Quite recently X rays have come to the aid of the crystallographer and displayed in the hands of Laue, Friederich and Knipping, Bragg, and others, the regular grouping of the atoms in a crystal.

The Geissler discharge tube known as the Plücker Hittorf or Crookes tube—the former beautiful plaything of the scientist—has proved the pioneer of some of the most wonderful discoveries and speculations that physical science of this or any generation has known."

That is, in brief, a summary of the events leading up to, and including, the discovery of X rays. These have, as can readily be seen, revolutionised our conception of the atom.

ACHIEVEMENTS AND POSSIBILITIES OF RADIATIONS IN MEDICINE.

The great advances in physics rendered possible by the accidental discovery of X rays by Roentgen have their analogues in the field of practical and experimental medicine. The immediate adoption of X rays all over the world by medical men working with physicists soon led to an appreciation of the value of the new agent.

No one at the outset could have foretold the immense strides the new agent would make in the short space of two decades. The use of X rays in diagnosis has been increased, and many important advances have been made as experience accumulated and apparatus was improved.

Far more interesting has been the gradual unfolding of the possibilities of radiations in therapeutics. The developments up to the present have been enormous. Still greater discoveries may lie before us, especially when, as a result of more extensive and intensive research, better understanding of the method of action of radiations in their application to the treatment of disease is arrived at.

It is necessary to indicate the ever-increasing field of activity before we attempt to deal with the technique and description of cases suitable for treatment. X rays when skilfully used can influence practically all the tissues which go to make up the living organism, the degree of action depending solely upon the quantity of radiation used and the response to it of the tissue affected. Here we have the possibility of acting upon one or all of the tissues by an agent of great power. Obviously the action must be a general one, whose activities are at present only vaguely understood. So far we know that definite results follow upon definite doses of radiations, and if this fact is grasped we go a long way towards a comprehension of the governing principle of radiation therapeutics.

Medicine, however, is not an exact science, and rules or laws which have a definite value in physics are not so readily applied to the practice of medicine. So far the applications of radiations in medicine are more or less empirical.

As already stated, the striking discoveries in physics have gone a long way towards explaining problems which have perplexed the human mind since the dawn of early civilisation. Possibly when our knowledge extends, and a thorough grasp of the physics of these agents and the underlying principles which govern their action has been obtained, it will lead to the development of a thorough technique and to a great improvement in the results obtained by their application to morbid conditions.

The developments may even be as revolutionary in medicine as they have been in physics. It may be even that the discovery of an underlying principle in cell metabolism may give us (by the aid of physics) the clue to the causation of certain diseases which have been the torment of many generations of medical men. Certainly the future teaching in the medical sciences must take more notice of physics. Medical education may be revolutionised in this way, and many of the now recognised and apparently well-established laws in medicine may, in the light of further research, require to be reviewed and possibly seriously modified.

EFFECTS OF RADIATIONS ON THE LIVING CELL.

A great deal of valuable work has already been done in regard to the behaviour of the living cell when exposed to radiations. Colwell and Russ have given us a valuable work in "X rays, Radium, and the Living Cell," which clearly sets forth the great effect which can be produced by radiations on cellular structures.

A thorough appreciation of the action of radiations upon the normal tissues will be valuable when we come to deal with morbid conditions. What we know now is very limited, and the result of the application of measured doses. Dealing with the subject broadly, it may be stated that if a particular cell or a group of cells be exposed to a beam of radiations

from any source, and in this example we will assume that the radiations emanate from an X ray tube, certain events may follow: (*a*) The cell may be stimulated; (*b*) its activities may be inhibited; (*c*) the cell may be destroyed.

The determining factor in the production of any of these ends so far as the radiations are concerned is the intensity of the radiation and the duration of the exposure. The former is governed by certain physical data which it is unnecessary to enumerate now.

In regard to the cell, the determining factor will be the resistance the cell possesses to external stimuli. Cells vary enormously in this respect, and, further, individual cells of the same type vary in a direct ratio to the stage of activity they are in when treated by the radiations. This is, in fact, the most difficult of the problems one encounters when estimating dosage.

It can readily be seen from a consideration of these facts how many and varied may be the results from a single exposure to radiations. It also indicates that treatment by radiations must of necessity be solely in the hands of experts whose training will enable them to obtain the maximum of good, and, what is of equal importance, the minimum of harm in the treatment of diseased conditions.

It is clearly demonstrated that changes can be induced in cellular structures, and these might be described as the direct effects. There are, however, *indirect effects* produced which may have a far-reaching influence upon the metabolism of the organism. The human frame is a complex machine with many systems in full activity, each acting in sympathy or coördination with the others. Consequently when a particular group of cells which go to make up the area treated is acted upon by a measured dose of radiations various effects of an indirect nature are induced. If the dose is excessive, cell activity is arrested and the cellular structures die. The destroyed cells are absorbed or rendered inert by the activity of the surrounding tissues. When absorption takes place the products of disintegration are carried by the lymphatics to other organs in the body. Far-reaching effects may follow. The term "reaction" is applied to this phenomenon. The reaction may be severe and a rise of temperature lasting for several days may occur. This is obviously due to a powerful action upon the tissues. Products of disintegration of tissues may be circulated in the blood and serum and produce beneficial or harmful effects. If the former, the tissues are toned up and the patient improves. If the latter, the patient may be reduced to an extreme degree. This is specially liable to occur in the treatment of diseases of the blood, such as leukæmia, where, if care is not exercised, a rapid fall of the white cells may lead to a fatal leucopenia.

There are many interesting phenomena induced by radiations which could be discussed at great length, but time forbids.

In dealing with a subject of such scope and interest it is somewhat difficult in a single lecture to give an adequate description of all the points of interest, and much of value must be left to another occasion. What, I imagine, will be of the greatest value will be a brief consideration of the practical application of radiations to the treatment of disease, with short descriptions of technique and a summary of the value of the radiations in their application to particular diseases. These are numerous, since, as has been shown, X rays may influence practically all the tissues which go to make up the complex mechanism of the human frame.

THE TREATMENT OF DISEASES OF THE SKIN.

The diseases of the skin are particularly responsive to regulated doses of X rays. The proof of this lies in the fact that many skin specialists include in their armamentarium an X ray outfit, and, judging from the results produced by its use, it is not the least valuable of the agents employed. The treatment of skin diseases by X rays has led to the production of the radio-dermatologist, because it is evident that in this branch of medicine there is ample room for another specialist. I shall, therefore, not labour the point.

Suffice it to state that in the treatment of *ringworm of the scalp* X rays are very valuable. The technique has to be very thorough to produce accurate results. The method is not free from danger. Untoward results are not unknown. These are dermatitis and permanent alopecia. In view of the possibility of such results it is well to caution the parents of children undergoing X ray treatment that there is danger. The percentage of accident is small but it does occur, and we must admit the possibility of such regrettable consequences. The technique is readily carried out. The following diagram illustrates the manner in which the treatment is administered.

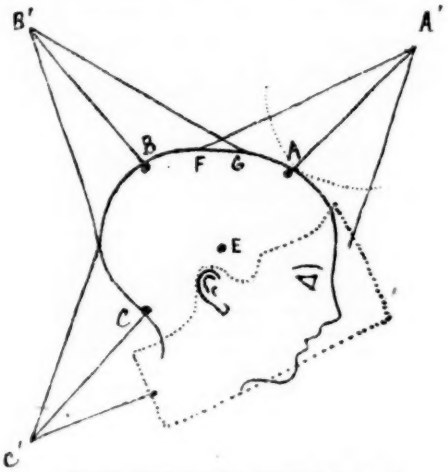

Diagram showing centres of areas to be rayed.

Dr. Adamson is responsible for the introduction into this country of a method of exposure which in skilled hands yields satisfactory results. It consists briefly of the division of the scalp into five areas, each of which gets a measured dose. The diagram shows four of the areas marked on the scalp; the fifth is given to a corresponding area opposite.

A number of other diseases of the skin are amenable to skilfully applied doses of X rays.

Rodent ulcer very frequently calls for X ray treatment, and the results are, on the whole, an improvement on those obtained by other methods. Operation offers in the early case a better prospect of cure. X rays, however, quickly heal the ulcer. There is a tendency to recrudescence, and it is not at all uncommon for a case to require treatment extending over several years at intervals. On the whole it is better to treat rodent ulcer with radium. The dosage is more accurately controlled, and the results are better and tend to be more permanent.

Malignant disease of the skin.—The technique employed should be that for malignant disease generally, though in cases of superficial epithelioma and a number of cases of rodent ulcer unfiltered radiations may be used for the earlier doses, a gradual increase of the thickness of the filter being employed to ensure the adequate irradiation of the deeper structures.

Hyperidrosis.—This troublesome condition readily yields to radiations. It should be more widely employed than it is at present. The result can be obtained by one or two large doses at an interval of two to three weeks between the exposures, but it is sound policy to aim at a slower production of the effect. Three or four exposures of each axilla at intervals of three weeks should lead to an arrest of the excessive perspiration. The aim should always be to control rather than to suppress the secretion. The technique is simple. The patient lies on a couch with the arm extended over the head, and the axilla is thoroughly irradiated with unfiltered radiations. Subsequent doses should be given through an aluminium filter.

THE TREATMENT OF ENLARGED LYMPHATIC GLANDS.

The growing experience in the treatment of enlarged glands is forcing upon us the conviction that in X rays we possess a remedy of great power. During the course of investigations, extending over many years, into the action of radiations upon tissues, I have found that the behaviour of the enlarged lymphatic glands, of whatever nature, is such as to indicate unmistakably that the effects may be far-reaching. X rays and radium have been extensively employed in these investigations. Either will succeed if the proper

dosage is administered. The response in a large number of cases has been very marked and almost invariable, the chief matter being the selection of the suitable radiation for each condition dealt with.

Diagnostic Value of X Rays in Enlarged Glands.

It is so certain that several types of enlarged glands will respond to radiations that we might employ the rays in a diagnostic as well as in a therapeutic sense. It has been observed that enlarged glands respond in somewhat like the following order to estimated doses of radiations.

1. Enlarged glands due to simple inflammatory conditions give a very rapid response if suppuration has not set in and the condition is becoming chronic.
2. Lymphadenomatous glands give a fairly rapid response, but not so rapid as the simple inflammatory ones.
3. Sarcomatous and lympho-sarcomatous glands give a rapid response in the majority of cases treated, leading to a rapid diminution in the size, but the effect is rarely permanent, there being a tendency to recurrence, and an ultimate refusal to respond to further treatment.
4. Tuberculous glands give a slow response as a rule. When treated early enough the glands become quiescent and slowly subside, but if not completely fibrosed they tend to break out at a later period.
5. Carcinomatous glands give a very slow response. They hardly ever completely disappear, but they may be arrested in their growth. It is, then, sound practice to remove the glands surgically.
6. Enlarged glands due to a mixed infection are fairly common. For example, in a patient suffering from carcinoma in an adjoining area the glands may enlarge in groups and yet no secondary cancer be present, or the glands on the opposite side from the lesion may become enlarged. These will quickly subside under radiation treatment. All, or nearly all, may disappear, or one or more in a group of enlarged glands may persist. These may ultimately be found to have invading cancer cells in their substance. Only a few groups of cells may be found, the bulk of the enlargement being due to inflammatory reaction, and there may be a secondary infection due to other organisms. The same condition may occur in tuberculosis. A group of glands may have only one or two which are actually invaded by the tubercle bacillus. In both of these instances, if the glands are treated by X rays, a mixed response is obtained.

From a consideration of the above statements it is obvious that in X rays we possess a differential diagnostic test which may be extremely useful when we are in doubt regarding the nature of the causal condition.

Therapeutic Radiation of Tuberculous Glands.

The irradiation of enlarged tuberculous glands is useful for other purposes than that of the glands alone. Coexistent or chronic tuberculosis of the lungs may at the same time receive benefit from the radiations, and it is a matter for serious consideration whether all such cases should not have radiations applied as a part of the routine treatment.

A considerable amount of this class of work is being done, and it will be interesting to have later a report from sanatoriums which have adopted the method. The general tonic action of radiations should also be helpful in these cases.

The treatment in all cases of enlarged glands must be thorough. In sanatoriums where the patient is at rest and under observation daily doses may be given, a fresh area being selected each day and the exposure repeated to the same area not oftener than once in 14 days. The aim in tuberculosis cases should be to include the thoracic contents, particularly the mediastinal gland, in the field of irradiation, so that all deep glands may receive adequate exposures. In less acute cases the treatment may be given once or twice a week. The dose at each visit will vary with the condition requiring treatment. Tuberculous glands require to be treated for a lengthy period of time extending over many months

ENLARGEMENT OF THE THYROID AND THYMUS GLANDS.

There are no groups of clinical symptoms, such as occur in exophthalmic goitre or Basedow's disease, which call for more skilful treatment than those associated with disorders of the thyroid and thymus glands. The combined skill of the clinician and the radiologist is necessary to combat successfully the complex phenomena exhibited in this disease. There can be no question that a combined attack, using all the measures available, will enable us to check the symptoms and ultimately cure the disease in a number of cases. These vary in the degree of acuteness, and the treatment will require to be varied accordingly, if a successful issue is to be looked for. Sanatorium treatment combined with medicinal measures and radiations affords us the treatment *par excellence*.

The very acute case demands absolute rest in bed, quiet, careful diet, fresh air, and practically a continuous action from radiation treatment. Small doses of the latter daily may be required over several weeks before any sign of improvement shows itself. Later, when the severity of the symptom abates, the treatment should be gradually diminished in intensity and frequency, and when the metabolic balance is gradually restored the dosage may be reduced to three times a week, and, later, given at longer intervals.

X Ray Treatment in Exophthalmic Goitre.

Three areas of the thyroid gland should be irradiated, one on the right side, another on the left, and a central large area should include the isthmus of the gland and the upper thoracic region, the object being to include the thymus gland, which is generally enlarged in these cases. Experience has shown the value of including the thymus in the irradiated area. It is well to use filters of 2 or 3 mm. of aluminium, and in addition a secondary filter to protect the skin. The latter should always be carefully protected from over-dosage, because if this should occur, even to a slight extent, it may be followed later by teleangiectasis, which is a troublesome complication.

Treatment should be continued at intervals over a long period of time in these acute cases. Patients complain of a tendency to relapse if this is not done, and it is quite possible to maintain the balance of activity of the gland by such treatment.

Fortunately the majority of cases treated do not require such systematic treatment. There are many patients who are not acutely ill, and though these would improve more rapidly under the stricter regime, circumstances may not allow of such vigorous treatment and it may be necessary to treat these patients at an out-patient clinic. Several hundreds of such cases have been treated by visits of once, twice, or three times a week. The dosage is similar to that described for the more acute cases, and the treatment requires to be carried on over many months. In the majority of cases the progress is satisfactory, there being a gradual restoration of balance of health, a diminution of the symptoms, and a slow but steady reduction in the size of the enlarged gland.

Better results in the more chronic cases have been obtained by the administration of small doses at frequent intervals than were formerly met with when the larger doses were given at intervals of three to four weeks. It is not necessarily cases of very large thyroid glands which respond most readily. The aim of treatment is to regulate the secretion from the gland, and a small gland may be very active. A regulating dose may check the activity, and so influence the condition.

Parenchymatous Goitre and Other Conditions.

Another form of enlarged thyroid met with is the parenchymatous goitre, where the chief disturbance is due to the enlargement, with few or none of the general disturbances. These cases require careful treatment, the gland being very difficult to treat, and the reduction in size being very slight and very slowly induced.

A number of these cases appear to respond more rapidly when radium is used. Possibly the tissues are more resistant because the enlargement is due to a general increase of the structural tissues as against the glandular hyperplasia with over-secretion in the cases of exophthalmic goitre. In parenchymatous goitre the claim of surgery should always come first in treatment.

Malignant disease is another form of enlargement of the thyroid. This is very untractable to radiation treatment. Operation, if possible, offers the best chance of cure in those cases. Failing this, radium should be used. Large quantities of radium are required, and the filtration should be through 3 mm. or 4 mm. of lead or 2 mm. of platinum, and long exposures given. X rays of a penetrating type may also be useful.

Enlargement of the thymus in children frequently requires treatment. X rays will be found useful in these cases.

THE TREATMENT OF DISEASES OF THE BLOOD AND DUCTLESS GLANDS.

X rays may be employed in the treatment of a number of these conditions. In dealing with the diseases of organs affected by morbid growths the skin receives a large percentage of the radiation, and it has been noted that in this way the blood while circulating in the tissues receives a dose which may exercise an influence far-reaching in its action not only upon the constituents of the blood but on the tissues through which the blood circulates.

It is, therefore, a good practice to irradiate large areas of skin surface as well as the spleen and the bone marrow when dealing with diseases such as leukæmia. When it is necessary to get a rapid action the greater part of the surface of the body may be utilised for this purpose. Patients who have been treated for other diseases show upon examination a marked improvement in the blood. This is known by an increase in the percentage of hæmoglobin and a raising of the colour index, and if a blood count is taken it may show a marked increase in the percentage of the red blood corpuscles. Patients who have been treated by X rays for fibroid of the uterus frequently show this marked improvement in the condition of the blood. The change is, however, due to other causes. For instance, the checking of the excessive hæmorrhage induces an arrest of the secondary anæmia which accompanies it.

Patients treated for cancer also frequently show an improvement in the blood condition, evidenced by an increase in the number of red cells and a nearly normal colour index. These improvements undoubtedly occur, though they may be only temporary.

Most of the diseases in which there are blood changes have been subjected to radiations in the hope that benefit might accrue. Evidence exists which proves that it is possible to exercise a considerable influence upon a number of these diseases. Leukæmia generally responds for a time at least to radiations, and there is no reason to assume that the improvement is only a variation in the course of the disease. The effects are too marked and exist for too long a period for this to be so.

Technique for Diseases of the Blood and Ductless Glands.

This will vary with the effects we wish to produce. If a rapid action is required it should be the aim to induce a profound effect upon the blood cells. This can best be done by irradiating large areas of the skin surface with very lightly filtered rays. The first inch of tissues below the skin absorbs about 75 per cent. of the total of these rays, and consequently if the blood-supply is up to the normal the percentage of radiation absorbed will be considerable. When deeper effects are likely to be more helpful then more penetrating radiations may be employed. A filter should be used to absorb a percentage of the softer radiations.

For the irradiation of the spleen and other deep organs filtered rays are employed, the filter in this case being used to protect the skin, which is likely to receive large doses of rays if repeated applications are required.

THE TREATMENT OF DISEASES OF THE PELVIC ORGANS.

Early in its history the extension of radiation treatment took in the diseases of the uterus, and attention was particularly directed to the enlargement of the uterus arising from fibromyoma. The effect upon these structures was led up to by experimental work carried out in 1905 by Halberstädter, who first noticed atrophic changes in the ovaries of rabbits as a sequel to irradiation by X rays.

Similar observations were made by Bergonié, Tribondeau, and Recamier. Reifferscheid described changes occurring in the human ovary as a sequel to irradiation by X rays. These effects were observed in cases treated by X rays and subsequently operated upon. Many other observers have recorded changes produced in the ovary as a result of prolonged X ray treatment. The majority of the results given are presumably those produced by relatively small doses of X rays, and no details are submitted as to the penetrative quality of the ray or the filtration employed. Albers Schönberg, Henish Bordier, and later Gauss and Lembekte, give results obtained by the more intensive form of treatment, the latter having worked out a very extensive technique, using filtered rays of moderate penetration, and giving results showing improvement as the intensity of the dosage increased.

Later work in America and England on intensive lines has given improvement in results altogether greater than was at one time thought of. The advent of the Coolidge tube and apparatus capable of exciting it adequately have further improved the technique and put within our reach the possibility of administering fairly large doses at a considerable depth from the surface of the body. Further, the introduction of many ports of entry and the angling of the tube to focus the beam of rays upon a given part have rendered it possible to increase greatly the dose at a given spot. The ovary on either side is taken as the landmark upon which the rays should be focussed.

Mode of Action of the Radiation.

The action of the rays appears to be primarily exercised on the ovary and its blood supply, suppression of function leading to atrophy of the structure and cessation of the menstrual hæmorrhage. The latter is the most troublesome symptom arising from fibromyoma. The improvement in the patient's health may in fact be attributed to the cessation of the hæmorrhage. The atrophy of the ovaries is, however, accompanied in a number of cases by a diminution in the size of the tumour. It is reasonable to assume that an action is exercised on the tumour itself. It is, therefore, advisable when treating the ovarian areas, to include the tumour as well.

The anterior abdominal wall is mapped out into a number of areas. The tube is arranged in treating each area so that the beam of rays may be focussed upon a given spot. If each ovary gets the maximum effect from those "ports of entry" on the side in which it lies, the tumour also receives a very large proportion of the radiations passing through it. A part of these radiations being absorbed by the tumours, changes must therefore occur in its structure as a result of the dosage it receives.

Whatever the action may be and upon whichever structure the rays act most, there is no doubt whatever that in the treatment of those conditions many marked beneficial results can be obtained by carefully applied courses of radiations. It will therefore be necessary to describe in some detail the technique now employed, the type of case likely to benefit, and to analyse the results obtained.

Technique for the Treatment of Fibromyoma of the Uterus and Other Conditions of the Pelvic Organs.

The technique, although chiefly employed for the treatment of fibromyoma, may be also applicable to such conditions as tumours of the other pelvic organs, the ovary, malignant disease of the pelvic organs, and in the prophylactic treatment of cases of new growth after removal. It is also applicable in a modified form for the treatment of conditions such as endometritis, fibrosis of the uterus, and for the production of sterility in conditions requiring such treatment.

With a modern installation the Coolidge tube offers advantages over any other tube in use. By using a high-tension transformer with the tube a uniform series of exposures can be readily and rapidly carried through. The heating current is adjusted to give the desired penetration and the whole series of irradiations can be administered under precisely the same conditions. The dose should be measured by the Sabouraud and Noiré pastille, or by a photographic paper, or by any method which is known to be reliable.

A filter of at least 3 mm. of aluminium is used, and it should be placed, if possible, midway between the tube and the patient's skin. The secondary filter, consisting of chamois leather, several layers of thick paper, and loofah sponge, enclosed in a linen bag for convenience, is placed upon the skin under the tube box. The time taken to produce the tint B varies with each installation, and the current it is capable of passing through the tube. An average of about five minutes to each dose can easily be obtained, using 2–3 ma. in the coil circuit. If the current is increased the time will be shortened proportionately to the amount of the increase in the intensity. A "hard" ray is necessary. Between 8 and 9 on the Bauer qualimeter is a useful radiation to employ in these pelvic conditions.

The anterior abdominal wall is marked out into a predetermined number of areas, the landmarks used being the level of the umbilicus and the pubic arch. As many as 20 ports of entry can be utilised in this way. In addition, the areas may be extended into the lateral wall of the abdomen

and the posterior aspect. These extra areas are useful when it is necessary to get in a very large dose quickly in acute cases. Each area receives the same dose of radiations.

The Question of Dosage.

It is advisable to commence the treatment just after the cessation of the menstrual period in cases where that is possible. The whole of the areas may be treated at one seance where it is necessary to do so, but from experience it has been found that it is better to divide the dose into two or three days. This diminishes the exhausting action on the patient arising from the continuous treatment of one or two hours or more, and lessens the after-effects upon the patient.

The aim of treatment is to produce the result gradually, so it is necessary to give three or more seances before the patient is really benefited. It is quite possible to produce a result in one or at the most two seances, but the effect on the patient is often very injurious for a time, as serious reaction may be induced when the very intensive line of treatment is adopted. As a rule, in the average case a satisfactory result may be looked for in from 3 to 6 seances, each consisting of 10 to 12 areas. It is not at all uncommon for the period after the first seance to be more excessive than those before the treatment, so it is necessary to caution the patient on this point if she is not to be discouraged and discontinue the treatment.

The improvement is gradual, beginning, as a rule, after the second series of treatment. The menstruation or hæmorrhage generally ceases after the third series and may not be seen again. It is, however, advisable to administer one or two further series in order to keep up the action.

Immediate and Later Effects.

There are certain conditions produced by the treatment of which the practitioner should be cognisant if he is to be in a position to advise his patients on these and other points of importance arising in the course of treatment. Of these the most important is the so-called reaction induced by the effects of the radiation. These may be divided into (*a*) immediate effects, (*b*) later effects (reaction, &c.).

Of the *immediate effects* nausea is most common. This is probably due to the inhalation of highly ionised air which is invariably found in the vicinity of high-tension electrical machinery and possibly to the generation of ozone in the vicinity of the active X ray tube. Headache is often met with and is attributable to the same causes. Giddiness is a common symptom and may be directly traced to change of posture, most patients suffering temporarily and briefly from this when they arise from the X ray couch. Patients frequently go to sleep while being treated. This is possibly due to the monotonous hum of the active electrical apparatus.

The remedy for most of these conditions is simple. For faintness a small dose of sal volatile will suffice. Eau-de-Cologne sprinkled on a towel and laid over the patient's face will serve to minimise the effects of the ozone and ionised air. An electrical fan in the near vicinity of the tube will quickly change the air and carry off some of the ionised air. In prolonged treatments a little oxygen in an inhaler will revive the patient.

The *later effects* come on several days after the treatment, and their appearance has a direct relationship to the intensity of the dose. In large doses it comes on earlier, possibly the next day, but in the average not for two or three days. In cases where the dosage has been very heavy intense prostration may follow, with rapid pulse, raised temperature, and feelings of malaise. The temperature may rise to 103° and 104° and remain at this limit for some time, when patients may become extremely ill. The treatment consists of rest in bed and careful attention to diet. Medicinal treatment should be used as the symptoms indicate.

The patient generally recovers in time for the next series of treatment, which is due, as a rule, in about a month from the preceding one. Generally a degree of tolerance to the treatment develops and the patient shows hardly any reaction to subsequent doses, but a number of patients never acquire this tolerance and dread the repetition of the treatment on account of the distressing symptoms it produces. In these cases it is probable that the dosage has been too great for the patient's general resistance. The after-effects may in these cases be minimised by giving the treatment at longer intervals, or giving smaller doses and carrying the total amount over a longer period.

Type of Case likely to Benefit from X Ray Treatment.

Although it may be assumed that tissue changes may be induced in practically any form of pelvic disease, and that in a number of these the action will be beneficial, yet for practical guidance it is necessary to survey carefully the field of usefulness and indicate where radiation treatment is likely to give better results than other methods such as the operative, where it is likely to help towards a cure when combined with the operative and other forms of treatment, and particularly to indicate when it is wise to hold one's hand and decide against X ray treatment. This involves a résumé of the conditions met with, particularly in the present instance with regard to fibro-myoma.

While it has been admitted that up to the present the interstitial fibroid is the most suitable for radiation treatment, several writers have pointed out that practically all forms of fibroid respond favourably. The small tumour is more likely to become amenable to treatment than the very large tumour which fills the pelvis and the greater part of the abdomen. It is also worthy of note that the majority of the patients submitted to X ray treatment have been for one reason or another unsuitable for operation. Hence the results secured in a number of cases have been obtained in patients who were too bad for operation, and therefore presumably not favourable subjects for any form of treatment from the curative point of view.

A typical instance of this is found in the case of a patient who was rapidly sinking from profuse hæmorrhage, and who in the earlier stage of her malady refused to submit to operation. Later, when she was willing to do so her condition was so grave that the surgeon refused to operate. As a last resource she was taken to an X ray department in an ambulance. Treatment was pushed vigorously and in a short time the patient was out of danger. Later she made a complete recovery.

Sir John Phillips in a valuable paper[1] states that he has used X rays in nearly all forms of fibroid with beneficial results.

Any case of fibroid tumour will be benefited by radiation treatment if the symptoms are not urgent enough to call for immediate operation. The need for operation may be determined by: 1. The amount and frequency of the hæmorrhage and the secondary effects upon the patient. 2. The size of the tumour and rate of growth. 3. The pressure effects upon other structures. Even in this class of case radiotherapy may achieve results if the patient is willing to risk the effect of very intensive treatment and any other danger incident to its use.

There are other factors, such as the age of the patient, which may be taken as a guide to the practitioner in these cases. Till recently it has been said that patients under 40 years should not be treated by X rays or radium. More recently it has been found that at any age the patient may be beneficially influenced, and that if modified results are all that are required it is possible to produce them. Instances of this kind will be met with in severe dysmenorrhœa associated with an infantile type of uterus. Such patients should be warned of the probable complete cessation of menstruation if the treatment is pushed to its limit.

There are other conditions than fibroids, such as menorrhagia from any cause and endometritis, which may be influenced by treatment.

Put briefly, the advantages the treatment possesses over other forms are that it is quite painless, and, if it fails, operative measures may be employed under the same conditions as before or even under improved conditions. It is not accompanied by so much risk as the operative, and the after-effects are not so disturbing or lasting. Reaction may, however, in a number of cases be rather disturbing. The final result is brought about gradually and the patient is not so seriously affected by the climacteric symptoms induced in both methods of treatment. It is perhaps obvious that if the patient has the whole matter put clearly before her she may decide upon the radiation method in preference to the operative.

THE TREATMENT OF MALIGNANT DISEASE.

The treatment of malignant disease by radiations, as has been shown, is now widely recognised. The indiscriminate use of the method has in the past somewhat detracted from its value. In the earlier days X rays were tried in hopeless

[1] THE LANCET, 1918, i., 427; Archives of Radiology and Electrotherapy, 1918.

cases. Even now we are compelled to resort to their use in cases which we recognise as beyond the reach of any therapeutic agent so far as cure is concerned.

Palliative Treatment.

This leads us to the consideration of the palliative use of X rays in cases which are quite hopeless. Pain may be relieved, tumours are reduced in size, and the general health of the patient improves. The treatment is palliative in another sense, because it must be recognised that in bad cases of cancer, where it is known that the patient cannot be cured, the mental state of the patient has to be considered. Careful use of X rays in these cases will give an amount of comfort to the patient which is altogether out of proportion to any physical benefit received.

It is pathetic to have to deal with these patients. The hope of benefit, even cure, from, to them, a wonderfully powerful agent, takes possession of them to the end. Patients will struggle to the X ray room when it is obvious to all that they cannot possibly be relieved of their troubles. How far it is justifiable to encourage these patients I leave to the practitioner to decide. It is, however, noticeable that if nothing at all is done to help these victims they soon lose hope, become depressed, and quickly succumb to the malady.

In this relationship it is remarkable how much response may be obtained in extensive superficial carcinoma involving the skin and adjacent structures. I have seen extensive involvement of the skin clear up under practically continuous X ray treatment. By this is meant daily doses to numerous areas of skin. The treatment may be carried on for several weeks in this way.

Possibility of Good Results in Very Grave Cases.

Cases which are apparently hopeless respond well to the radiations, and a period of good health results. A striking instance of this kind may be quoted.

A man of about 35 had a sarcoma of the right testicle removed by operation. I saw him about two years after the operation. He was nearly in extremis, the abdomen was enormously distended, and there was serious engorgement of the superficial vessels of the anterior abdominal wall. The abdominal cavity was filled by a large mass of new growth, this being nodular and very hard. The legs were œdematous, and, to judge from the physical condition of the patient, treatment seemed as if it would be useless. However, it was thought advisable to attempt to help the man. Large doses of X rays were administered to several areas of the abdomen—back, front, and laterally—the idea being to get in a large dose rapidly. Improvement soon set in, the tumours diminished, and the swelling of the legs subsided slowly, this being aided by regular massage to the limbs.

In about three to four months the patient was able to walk. He attended as an out patient for over a year, receiving treatment at intervals. It is now over a year since treatment was commenced. The patient is at work and is able to carry on, the condition being quiescent. He remained well for over 18 months, when he returned for further treatment.

The next case, although not one of malignant disease, illustrates the degree of influence which can be exercised over a very large tumour.

A patient attended the Great Northern Central Hospital over eight years ago suffering from an enormously enlarged spleen, the organ reaching down nearly to the pubic arch. He was anæmic and appeared to be rapidly going down hill. He was admitted to the hospital and received doses of radiations three times a week for a month. At the end of that time there was no visible improvement and the question of removal of the spleen was discussed. I asked that a continuation of the treatment should be advised after a short interval. This was done, the spleen steadily reduced in size, and in about a year had returned nearly to the normal. Treatment at intervals of three or four weeks was administered. When last heard of about a year ago the patient was in good health and had been actively engaged in business for about eight years.

These cases are, I admit, exceptionally good from the point of view of treatment. The prognosis in both was as grave as it could be, yet both responded to treatment in a remarkable way. I quote them in support of the treatment of hopeless cases by palliative measures, because we cannot say when a patient will not respond in some measure to the radiations.

In our endeavour to obtain results in these cases we resort to combined treatment by X rays or radium and the injection of salts of metal in a colloidal form. Theoretically the proposition is a sound one, since it is possible to obtain secondary radiation effects from this method. I am quite of an open mind in regard to the value of colloidal salts of metals. I have seen good results obtained, but, on the other hand, the results obtained by radiations alone are equally good.

I am often asked about the value of potassium and magnesia salts in this connexion. No objection should be raised to their use, since theoretically, if we can saturate the tissues with the salts, the radiation effects may be enhanced. The only proviso I make is that they should be discontinued if the patient's health is affected by their use.

Salvarsan and its substitutes may be used, good results being sometimes seen when it is combined with radiations.

Prophylactic Treatment.

It is reasonable to assume that if it is possible to bring about the disappearance of a small superficial nodule of new growth by X ray treatment, it should be possible to effect a similar change in structures more deeply situated in the body.

In the first place, after an operation for the removal of a cancerous growth the tissues in an area spreading from the seat of the growth are damaged by the manipulations of the surgeon, and therefore more prone to become infected. Secondly, the fluid from the growth itself may contain cancer cells in an active condition, and these, if squeezed into the tissues along with the lymph, may settle on damaged tissue, and so at a later date give rise to what is known as a "recurrence." Thirdly, the lymphatics spreading out from the region of the tumour may already be infected or deep-seated glands may be involved. It is in the hope of checking the development of one or other of the above complications that we resort to prophylactic treatment.

In view of the above facts it is logically certain that the sooner the treatment is commenced after operation the more probable is it that a beneficial influence will follow. Indeed, several authorities advocate the pre-operative treatment in addition to the post-operative. A number of workers advocate the administration of the first treatment at the operation when the tissues are fully exposed. The only objection to doing so is the time it takes thoroughly to irradiate the whole area of the wound, the lymphatics in the axilla and superclavicular areas and the deep mediastinal glands. If this method is employed the first dose should be confined to the open wound. Later, in a day or so, the patient will be able to submit to further treatment if the apparatus can be brought to the bedside.

In whatever way the treatment is commenced it must be thoroughly administered so as to cover all possible sites of recurrence, and the treatment should be kept up for about one year or longer from the time of the operation. Opinions differ in regard to the frequency of the dosage. Some good results have been seen in patients who have had many weekly doses, followed at a later date by fortnightly treatments. The dose in these instances has to be rather smaller at each séance than in those treated at longer intervals. The technique should be similar to that described for the treatment of uterine diseases.

It may be asked what proof have we that prophylactic treatment does any good at all, and the question is a pertinent one. We can produce no proof that recrudescence is actually prevented, but we know that, in the experience of radiologists, a result of the treatment is that the percentage of superficial recurrence is somewhat smaller in the later years of treatment than it was in the earlier when the technique had not been perfected. Manifestations still appear in the deeper structures—i.e., in the thoracic walls and glands of the neck, axilla, and mediastinum. The time has not yet come when we can make any positive statements on this point. Years may elapse before we can prove by statistics that any good is being done in the way of preventing recrudescence, but in the meantime we can definitely state that radiation treatment helps the patients in other ways. A general tonic action is evident, scar tissue is rendered pliant, the recovery of limb movements is facilitated, and, lastly, the patient is encouraged to help herself and is supported in this effort by the fact that others are endeavouring to help her

Curative Treatment.

The last and not the least important of the uses of radiations in dealing with malignant disease brings us to a consideration of the value of these in an attempt at the cure of a particular case. How far have we reached towards this

end? Great care and judgment are necessary in arriving at a decision to rely solely on either X rays or radium for the cure of a new growth.

The first consideration is whether there is any prospect of curing an early case. Undoubtedly a number of cases have been cured by a thorough exposure to X rays or radium. Such cases are naturally early ones where the lesion is superficial, and therefore readily accessible to the radiations. Rodent ulcer can be so dealt with, and superficial epithelioma may also disappear after treatment and remain cured for lengthy periods.

Sarcoma is another condition in which success may be obtained.

One particular case occurs to me in which a recurrent growth on the face was completely cured by a course of radium exposures. The original growth had affected the eyelid. Recurrence had been dealt with on two occasions by operation, as had also the primary manifestation. The glands on the affected side in the cervical region had become involved. The patient was treated eight years ago and, so far as is known, remains healed. When last heard of about a year ago she was quite well.

The final judgment is, however, in favour of operation in all early cases of cancer, because the balance of opinion is against an attempt to cure by radiations when an operation can so easily be performed and a radical excision offers the best chance of cure. Delay in these cases is always dangerous, because it is not yet possible to be certain that radiations will invariably yield a successful result, and surgery may ultimately have to be employed under much less favourable conditions if we fail to bring about a disappearance of the growth by X rays and radium.

AN ACCOUNT OF

AN INFECTION IN MESOPOTAMIA DUE TO A BACILLUS OF THE GAERTNER-PARATYPHOID GROUP.

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(*A Report to the Medical Research Committee.*)

A SERIES of inagglutinable organisms culturally and morphologically indistinguishable from *Bac. para. B* have been isolated from the blood stream by the writer in Bagdad between July and December, 1918, and it is learned that similar findings have been recorded in a number of cases in other areas of Mesopotamia. In view of the bacteriological results obtained and pathological lesions revealed at autopsy in three fatal cases which occurred, an account of the findings, along with a note on the clinical history of the series of cases, has been deemed worthy of record to draw attention to the possibility of other cases of fever with or without marked pulmonary lesions being due to the same organism, as well as to raise the question of its relationship to the infections of the classical "enterica" group, especially paratyphoid B fever.

Characters of the Organism Isolated from the Blood and from the Various Organs.

The several strains of the organism under review all have the cultural and morphological characters of the Gaertner-paratyphoid group. It is most closely related to *Bac. para. B* and, as will be shown, it does not appear to belong to the *Bac. aertrycke* type. Up to the present the organism has been obtained from nine cases, from seven of which it was isolated during routine blood-culture investigation of "P.U.O.'s." In the remaining two cases it was isolated at autopsy from the lungs and spleen, no blood culture having been carried out during life. The organism has so far not been isolated from the urine or stools in spite of numerous examinations, but at one of the autopsies it was obtained in pure culture from the bile.

All the strains give similar microscopic appearances—an actively motile short, stout, Gram-negative bacillus or coccobacillus, with some tendency to pleomorphic formation. The growth on agar is less transparent and oily in appearance than the usual paratyphoid cultures, and is usually more profuse. There is no liquefaction of gelatin. On MacConkey's medium the colonies are indistinguishable from the paratyphoids. Biochemically the organism produces acid and gas in mannite, glucose, dulcite, maltose, galactose and arabinose, no change occurring in lactose, saccharose, and inulin. Litmus milk becomes at first slightly acid, changing to alkalinity on the fifth to seventh day; there is no production of indol.

Serological Characters.

On isolation, all the strains were inagglutinable even in low dilutions of the high-titre sera (Lister Institute) for *B typhosus*, *B. para. A*, *B. para. B*, and *B. enteritidis* (Gaertner). After eight subculturings in broth spread over a fortnight, all the strains had become agglutinable to para. B serum in dilution of 200 and 250; while in the case of four of the strains, each of which was subcultured on 30 occasions, agglutination was obtained in considerably higher serum dilutions. Fine soft flocculi with a distinctly opalescent supernatant fluid were present in dilutions ranging up to 1000 and 2000 (titre of the para. B serum 6000), but marked sedimentation was never present in dilutions higher than 200 or 250. In none of the tests with para. B serum did I obtain the clear supernatant fluid which usually results in similar tests with *Bac. para. B*. Consistently negative results were obtained in the agglutination tests with all other high-titre sera (Dreyer's method slightly modified being the technique adopted).

Specific sera for three of the strains have been obtained by the immunisation of rabbits, a titre of 6000 to 10,000 being reached without any difficulty. All the nine strains were agglutinated to practically the full titre, whereas two stock strains of *Bac. para. B* never showed any signs of clumping in higher dilution than 1 in 250. For example, strain No. 6, which was obtained in pure culture from the lungs at autopsy by plating the lung juice on MacConkey's medium (as also from the heart blood and spleen), was agglutinated immediately after isolation by the rabbit immune sera for the strains No. 3 and 4 in dilutions of 8000 and 10,000 respectively, while para. B. sera (Lister Institute, titre 6000) failed to produce any reaction with this strain in dilution 1 in 50. "Zones of inhibition" were occasionally met with in the agglutination experiments both with the specific para. B serum, as well as with the sera obtained from the immunised rabbits, but no reference need be made to them in the present connexion.

It has unfortunately not been possible to obtain from England subcultures of recognised *B. aertrycke* strains, but through the kindness of Lieutenant-Colonel Ledingham, R.A.M.C., I was enabled to compare the reactions of a strain of presumed *Bac. aertrycke* isolated from an epizootic among guinea pigs by Major Gloster, I.M.S., at Amara. The behaviour of this bacillus with the sera produced from the immunised rabbits was very different from that of all the nine strains of the organism under review. Agglutination with sedimentation was present up to the 250 dilution, while the same indeterminate type of clumping associated with the the fine soft flocculi as was obtained with the stock *B para. B* was present up to a dilution of 1 in 1000. Nor did this *B aertrycke* strain become more agglutinable after repeated subculturings, while it may be noted that it clumped with the Lister para. B serum practically up to titre. Thus it appears improbable that the series of organisms under investigation belong to the *B. aertrycke* group, although the evidence is meantime incomplete in the absence of experiments with specific *B. aertrycke* sera.

Agglutination of organism with patient's serum.—One case —No. 1—is of special interest, in that it was possible to carry out agglutination tests with two lots of this man's serum against his own organism as well as against the others of the series. Unfortunately no serum was obtained before the twenty-fourth day of illness. On this occasion the

Dilutions of Serum of Case No. 1.

—	25	50	100	200	250	500
No. 1	++	++	++	±	±	–
No. 2	+	+	±	–	–	–
No. 3	++	++	+	±	±	–
No. 4	++	++	+	+	–	–
No. 5	++	+	+	–	–	–
Stock *B. para. B*	+	+	–	–	–	–
Stock *B. para. A*	+	–	–	–	–	–
Stock *B. typhosus*	+	+	–	–	–	–

serum gave negative results. On Oct. 28th, 1918—i.e., the forty-second day from the onset of No. 1's illness—blood was again obtained, and the following results were obtained in macroscopic agglutination tests with the serum against five of the strains and against our stock T.A.B. emulsions. This patient has been inoculated with T.A.B. vaccine in November, 1916, and again in February, 1918.

Absorption tests.—Although it was not to be expected that much information was to be gained from absorption tests when the Para. B agglutinogens of all the strains of the organism are relatively slight in character and produce such atypical flocculi as compared with those of the homologous organism, yet a number of such tests have been carried out. Out of six experiments with Strain No. 4 immune serum the following result was recorded in two instances:—

Strain No. 4 rabbit immune serum (titre 6000). Titre before and after absorption with (A) *Bac. para. B* and with (B) Strain No. 3:—

—	(A)		(B)	
	Original titre.	After absorption	Original titre.	After absorption.
B. para. B	250	<50	250	<50
Strain No. 4	6000	6000	6000	500
Strain No. 3	6000	5000	6000	> 500 < 1000

It is seen that *Bac. para. B* removed all the para. B co-agglutinins from the rabbit immune serum, but did not touch the agglutinins for the homologous or similar organism, whereas after absorption with a presumably similar bacillus (Strain No. 3) more than five-sixths of the agglutinins for the homologous organism were removed, as also were all the para. B co-agglutinins. In the other four tests such removal of the para. B co-agglutinins, by the strain presumably similar to the homologous organism, did not occur. This may have been due to the use of an insufficiency of organisms in the saturation of the serum, although from the extent of the removal of the homologous agglutinins this does not appear probable. The atypical character of the flocculi present in the ordinary agglutination tests and the incompleteness of the reaction, as shown by the persistent opalescence in the supernatant fluid, may throw some light on the inconstant results obtained, and further investigation in this direction is required.

In four experiments in which para. B. high-titre serum was saturated with strains No. 1 and 4 there was no absorption of the agglutinins for those organisms or for the homologous organism *B. para. B.* It is very probable, therefore, that we are dealing with a specific organism the serological characters of which are quite distinct from those of *B. para. B.*

Pathogenicity to Animals.

No special experiments to test pathogenicity have been carried out owing to the small number of experimental animals available. Some observations were made, however, during the course of preparation of immune sera in rabbits. One animal, which had previously received two intravenous injections of 225 and 900 million of dead bacilli, was found dead on the third morning after an intravenous dose of 500 million living organisms; while another rabbit died after 300 million live bacilli following on three doses of 300, 1200, and 3000 millions respectively of killed organisms, all given intravenously.

Post-mortem examination showed that both animals had died of a hæmorrhagic septicæmia. Petechial hæmorrhages were present on the pleural surfaces, as well as in the substance of the lungs. Some were larger than petechiæ, and in the case of the second rabbit one extensive hæmorrhage involved a third of the right lower lobe. Small hæmorrhages were present in both spleen and kidneys.

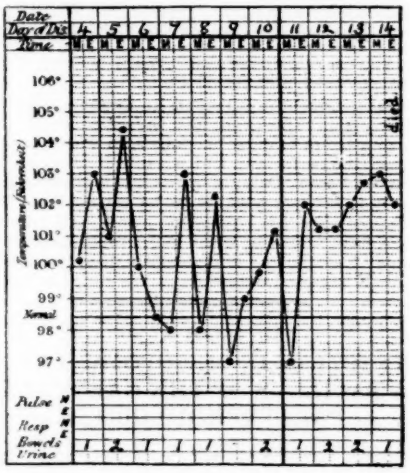
The intestinal tract also showed lesions of considerable interest. Discrete hæmorrhagic areas ranging in size from a pinhead to a millet seed were to be seen in the lower part of the duodenum, while in the jejunum and ileum they were well marked over a length of three inches, and extending in less degree for nine inches below. There was some associated œdema of the mucous membrane, but there was no naked-eye involvement of the lower part of the ileum or of the appendix. The great intestine appeared normal.

The Clinical Aspects of the Infection with Some Notes on the Morbid Anatomy.

The clinical history, &c., along with the post-mortem findings in the three fatal cases, is as follows:—

CASE 3.—Pte. W., aged 30, was admitted to hospital at Bagdad on Sept. 16th, 1918, with a fever, the temperature curve being suggestive of malaria, and the clinical symptoms of "influenza," of which there was an epidemic in Bagdad at the time. The man had been transferred from a convalescent camp, having been invalided from Persia for debility following clinical malaria. No malaria parasites had been found previous to admission, nor were any detected during several examinations while the patient was in hospital. After five days' intermittent temperature (98° to 104°) (see Chart 1) there appeared definite signs of a right

CHART 1.



basal pneumonia, spleen being palpable on deep inspiration. Condition became very critical and six days later patient died. There was no paratyphoid eruption. Leucocyte count on day before death 12,000 per c.mm.

Autopsy (10 hours after death). Lungs: Right middle and lower lobes in state of grey hepatisation. Upper lobe acute congestion. Left lung normal. Pleura; Right cavity contains 8 ounces clear serous fluid with a recent exudate of lymph over the affected lobes. Heart: Signs of dilatation. Myocardium soft and friable. Spleen: Twice the normal size, soft and diffluent. No pigment deposit to be seen by the naked eye or in smears. No malarial parasites detected. Intestines: Peyer's patches apparently perfectly healthy. Nothing abnormal seen in any part of the alimentary canal.

Bacteriology.—Cultures from the spleen and consolidated lung made direct on to MacConkey's medium gave a pure culture of the cocco-bacillus described above. This organism was agglutinated by its homologous serum obtained from an immunised rabbit in 1 in 6000 dilution. Originally inagglutinable to all the specific sera, after numerous subculturings, it reacted with para. B serum (titre 6000) as follows: Dilution 1 in 1000 +; 1 in 2000 ±.

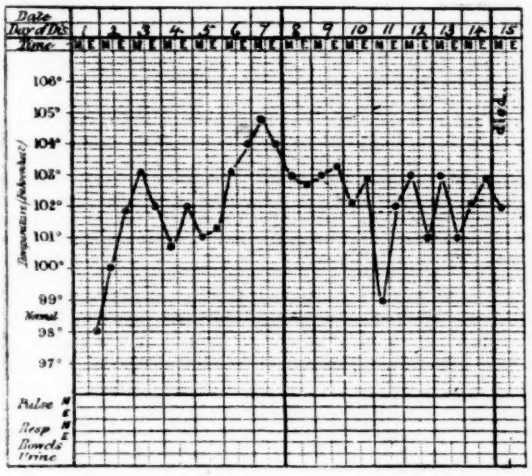
CASE 4.—Sgt. G., aged 40, had been 12 days in hospital suffering from vague nervous symptoms, having suffered from shell shock in France in 1915, from which he had never completely recovered. Patient appeared to be doing well during his 12 days' residence, when his temperature suddenly shot up to 102° (Chart 2) and there developed symptoms of bronchitis and rhinitis. On the third day of fever signs of a right apical pneumonia developed. Five days later the right lower lobe and also the left apex showed signs of involvement. No suggestive rose spots were seen. Restlessness and delirium latterly became a marked feature, the patient dying on the fifteenth day of illness.

Autopsy (14 hours after death).—Emaciation slight with moderate hypostatic lividity. Pleura: Right sac contains 8 oz. blood-stained fluid. No adhesions or lymph exudation. Left sac normal. Lungs: Consolidation of greater part of right lung—viz., whole of lower lobe, middle lobe, and posterior portion of upper lobe. In section the colour was yellowish grey, the consistence distinctly friable, with a suggestion of softening, while there was a purulent exudate on squeezing the consolidated areas. Left lung healthy except for marked congestion, especially of upper lobe.

Heart: Showed dilatation of the left ventricle with a large antemortem clot in the corresponding auricle. Myocardium pale, flabby, and easily friable. Spleen: Slightly enlarged, softish. Stomach and intestines (great and small): Normal in appearance except for a pink œdematous condition of the jejunum and upper part of the ileum. This may have been associated with the presence of several ascarides in the small intestine. Kidneys: Marked cloudy swelling with some fatty changes.

Bacteriology.—Three blood examinations for malaria during life were all negative. Blood culture on the ninth day of illness gave a pure culture of a Gram-negative coccobacillus with the characters above described, while at autopsy the same organism was obtained from spleen, lung, and contents of gall-bladder. Although originally inagglutinable, all four strains after a week's subculturing were agglutinated by para. B serum in 1:2000 dilution, tests with the other specific sera being negative. The serum of the animal immunised with this strain easily reached a titre of 10,000. Smears from the sputum during life, as well as from the lung juice at autopsy, showed some Gram-positive cocci in addition to numerous Gram-negative bacilli, but no organism morphologically resembling the pneumococcus was seen.

CHART 2.

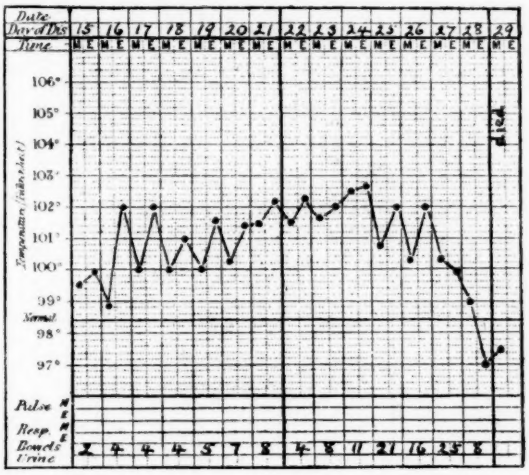


CASE 6.—Pte. D., aged 32, admitted to hospital on Nov. 20th, 1918, as suffering from anæmia, thought to be due to bleeding hæmorrhoids, gave a recent history of diarrhœa and colicy pains for the preceding 12 days. History of intermittent bleeding from the bowel during the previous two months was elicited, blood with clots being passed along with formed stool, while the occasional occurrence of prolapse on defæcation was reported. Four days after admission patient developed a condition which was diagnosed as acute bacillary dysentery. Fever asserted itself so that the patient's temperature reached 102° (Chart 3), while 4–6 non-fæculent motions were passed daily consisting chiefly of bright red blood associated with blood clots and a little mucus in the form of sago-like granules. Their appearance was altogether much more suggestive of intestinal hæmorrhage than of the usual acute dysenteric "B. and M" stool. On microscopical examination the cytology did not suggest bacillary dysentery, very few cellular elements being present apart from blood cells. No entamœbæ were seen while on cultivation on MacConkey's medium on three occasions, no non-lactose fermenters were in evidence. Blood films failed to reveal the presence of any malarial parasites. The blood picture did not suggest a primary blood disease. The only striking feature was the pallor and distortion of the red cells, but no megalocytes or nucleated red cells were seen.

At first the sigmoid felt definitely thickened and was acutely tender, but after several days this feature completely disappeared. The patient's general condition suggested marked toxæmia. He was treated with antidysentery serum, but no improvement ensued. On Nov. 28th—i.e., the twenty-first day of fever—severe watery diarrhœa set in, the stools being pea-soup like with flecks of blood. On Dec. 4th the temperature fell, collapse set in, patient falling into a comatose condition, and death took place on Dec. 6th.

Autopsy (performed 20 hours after death).—Body considerably emaciated; blood watery. Respiratory system normal. Cardio-vascular system: Pericardium normal; dilatation of right ventricle. Myocardium pale and fatty. Nothing else of note. Alimentary tract: Stomach: Small erosions in the mucosa. Lower part of duodenum and upper part of jejunum—mucous membrane œdematous with signs of acute congestion. Scattered petechial hæmorrhages but no erosions. Ileum normal. Large intestine: Congestion of transverse and descending colon with numerous small

CHART 3.



erosions and hæmorrhages in the mucosa. No marked ulceration and no thickening present. Liver and kidneys: Marked cloudy swelling with fatty changes. Spleen: Normal in size, soft and diffluent. Suprarenals and thyroid normal. Red marrow of sternum and ribs—no marked hyperplasia.

Bacteriology.—A bacillus with the morphology and cultural characters of the other organisms of the present series was obtained in pure culture from the spleen and heart blood. In the first agglutination tests with this organism after isolation the findings were: Against immune serum of strain 4, ++ 1 in 5000, + 1 in 10,000. Against Lister Institute para. B serum (titre 6000), nil 1 in 50.

Summary of Chief Symptoms.

As for the cases in general, some of the clinical data have been tabulated in Table A, while a summary of the notes on the chief symptoms observed is given below. No special stress can be laid on any clinical feature which may not occur in the course of enteric group infections, although the prominence of respiratory symptoms has been somewhat striking in the present series of cases.

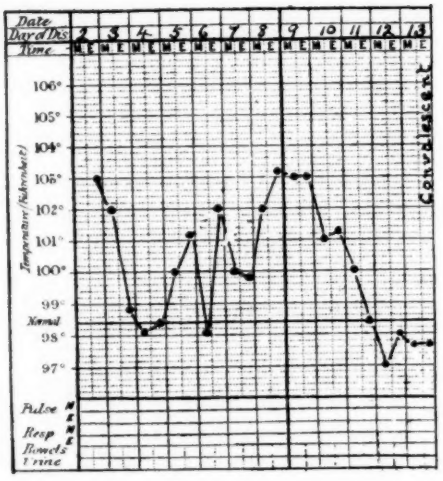
Course of the fever.—The fever, which was in most instances of sudden onset, appears to be of variable duration, depending partly on the relative severity of the infection, partly on the extent of involvement of the respiratory tract. The milder cases lasted 5–7 days on the average. Two patients (Nos. 1 and 7) each ran an 11-days' fever, at first intermittent and latterly of the continued type (see Chart 4). Of the fatal cases one of the pneumonias (No. 4) ran a continued fever during the whole 15 days' illness. The other (No. 3) showed a markedly intermittent course for ten days, becoming of the continued high type on the onset of extensive lung consolidation four days before death. The fatal "hæmorrhagic" case (No. 6) ran a 28-days' pyrexia, and was of the continued type during the 14 days he was under observation.

As regards relapses, none occurred while the patients were convalescing in hospital or subsequent to discharge, as far as could be learned from their after history.

Respiratory system.—Marked involvement of the respiratory tract was a feature of all the cases except three. Thus in four instances in which this inagglutinable paratyphoid-like organism was obtained by blood culture, the infections were of a mild character and of short duration, while bronchial catarrh was so prominent a feature that all four cases had been labelled "bronchitis" or "influenza with bronchitis." As already described, two of the fatal infections appeared clinically to be suffering from lobar pneumonia, as was subsequently proved at autopsy (Cases 3 and 4). Of the three cases with no respiratory symptoms two of them had been considered enteric infections, while the third was

regarded as a markedly toxic type of bacillary dysentery. Smears and cultures of throat swabs from a number of the patients gave nothing of pathogenic importance.

CHART 4.



Alimentary system.—Gastric and intestinal symptoms were in most instances inconspicuous. Vomiting, except in case No. 6, was absent, while constipation was the rule. Case No. 5, considered clinically an "enterica" infection, suffered from diarrhœa in the early period of the illness, while in the fatal "pneumonias" (Nos. 3 and 4) there was no lesion of the intestinal tract except that one showed a pink œdematous condition of the jejunum and upper part of the ileum. The Peyer's patches and solitary glands appeared quite normal.

The third fatal case (No. 6), however, showed distinct intestinal lesions, which have been described above. This patient had complained of marked hypogastric tenderness in the early days of his fever. Otherwise abdominal distension or tenderness was not a feature of the cases.

Nervous system.—There was no nervous symptom of special note. Delirium was present towards the end in the two fatal cases of pneumonia, while No. 6 sank into the typhoid state before death.

Skin.—Nothing suggestive of rose spots or of an eruption of any kind was seen in any of the series.

Abdominal organs.—Spleen.—Its size varied considerably in the different cases. Some of the notes report the organ as being slightly or distinctly palpable on deep inspiration. In one fatal case it was two fingers-breadth below the costal margin, while at the other two autopsies the organ showed nothing of special note. Malarial parasites or pigment was not seen in any smears of the splenic pulp. Liver, kidneys, and bladder: Nothing of special note. The usual febrile albuminuria was present in the cases examined. The presence of pus cells or other cellular elements was not observed.

Discussion.

The question as to whether this bacillus found associated with the present series of cases is an aberrant type of *Bac. paratyphosus B* or whether it is an undescribed organism (which for convenience may be called *Bac. paratyphosus C*) belonging to the Gaertner-paratyphoid group is a matter for discussion. The fact that, after as many as 30 subculturings, none of the strains of the organisms are agglutinated by specific para. B serum (Lister Institute) in any dilution at all approaching its maximum titre is important, especially when it is remembered that the isolation of readily agglutinable para. B bacilli during the course of routine blood-culture work in Bagdad has been far from uncommon. Consideration must also be taken of the unusual nature of such agglutination as was obtainable with high-titre para. B serum—viz., the very fine soft flocculi which seldom produced much sedimentation and which never left a clear supernatant fluid. Nor do the serological observations, described above, point to the organism having closer affinities to the *Bac. aertrycke* group, although it has to be noted that unfortunately it has not yet been possible to obtain from Europe any of the recognised high-titre *B. aertrycke* sera.

Clinically, although it is well recognised that marked respiratory symptoms may be a common accompaniment of paratyphoid B infections and, indeed, have been the chief feature of certain enteric epidemics, yet the local microbic infection in these cases is still a matter of dispute. Bacilli of the Gaertner-paratyphoid group have been reported on various occasions as having been isolated from the sputa, but as to whether they were originally present or were merely secondary invaders does not appear to have been conclusively settled. It has not been possible to consult the literature on the subject, but Miller,[1] in his recent Goulstonian lectures (1917) on Paratyphoid Infections, says:—

"The paratyphoid bacilli apparently do not attack the lungs and pleura themselves. Labbé, however, mentions a case of abscess of the lung from the pus of which *B. para. B* was isolated. Apart from this rather special case, I cannot find a recorded instance of paratyphoid bacilli being found in the pleural fluid ante mortem nor in the lungs post mortem. I can only think that if these organisms do attack the lungs and pleura it must be but rarely."

In the two cases of the present series which showed extensive pneumonic consolidation the organism was isolated from the lung juice in pure culture on MacConkey's bile medium, while, except for a few scattered diplococci which did not resemble the pneumococcus, it alone was seen in stained lung smears.

The duration of the bacillæmia is so far undetermined, as positive blood cultures were obtained from the third to the ninth days inclusive in the various cases. Marked involvement of the intestinal tract, except where the infection assumed the character of a hæmorrhagic septicæmia, was uncommon, and the absence of any lesion of Peyer's patches,

TABLE A.—*Statement of Clinical Data.*

No.	Clinical diagnosis of case.	Duration of fever.	Day of disease of positive blood culture.	Isolation of organism from other sources.	Probable place of infection.	Character of infection.
1	Bronchitis (N.Y.D. enteric group).	11 days.	9th day.	—	Bagdad.	A somewhat severe attack, the course suggesting an enteric infection.
2	Influenza with bronchitis.	6 ,,	3rd ,,	—	,,	A short but very acute fever.
3	"Clinical malaria" followed by lobar pneumonia.	14 ,,	No culture made.	Lungs, spleen, heart blood.	Kermanshah.	Both very severe and fatal infections with all the signs of lobar pneumonia.*
4	Bronchitis followed by lobar pneumonia.	15 ,,	9th day.	Lungs, spleen, bile.	Bagdad.	
5	Bronchitis.	7 ,,	4th ,,	—	Kifri.	A mild infection.
6	Acute dysentery (bacillary ?).	28 ,, (?)	No culture made.	Spleen, heart blood.	Tekrit.	A very severe toxic infection, with a hæmorrhagic colitis ending fatally.†
7	Bronchitis (N.Y.D. enteric group).	11 ,,	9th day.	—	Bagdad.	Nothing of special note. Clinically very suspicious of an enteric infection.
8	Bronchitis.	5 ,,	4th ,,	—	,,	Both mild short fevers.
9	,,	7 ,,	4th ,,	—	,,	

* See p.m. notes.

† See detailed notes on clinical history and autopsy.

[1] Miller: THE LANCET 1917, i., 831.

or of the solitary glands, may be of importance as a differential feature.

My attention has recently been drawn to an account by Neukirch [2] of an epidemic which occurred between March, 1915, and the early part of 1917 in Anatolia and Turkey from the cases of which an organism called *Bac. Erzindjan* was isolated. This organism, the author concludes, is closely related culturally to *Bac. para. B* and the *suipestifer* group, but it can be differentiated by serological tests. From the title of his paper Neukirch is inclined to identify the organism with the Glässer-Voldagsen group, placing his reliance on the agglutination test. Yet he states that all the strains of *Bac. Erzindjan*—like those isolated from the present series of cases—produced acid at first in litmus milk, followed later by alkali production, except one which showed no initial acidity. On the other hand, all the Glässer-Voldagsen strains tested produced acidity and remained acid until the end of the ten days recorded. It seems difficult to accept the serological similarity and ignore this constant biochemical difference between the organism under review and the Glässer-Voldagsen group. The cultural characters of *Bac. Erzindjan* cannot be compared with our *Bac. para C*, as Neukirch has so far described its action on glucose and lactose only.

This worker distinguishes two main clinical groups of cases from which the *Bac. Erzindjan* was obtained in pure culture: (1) the "typho-septic" type, with a mortality of 46 per cent.; (2) the dysenteric type, with a much smaller mortality of 6·7 per cent. For comparison he quotes a 5 per cent. mortality rate as having occurred among the infections of the "enterica" group. Two other groups are also mentioned—viz., four cases of slight general infection and a solitary case of pyelonephritis. Neukirch draws special attention to the very variable clinical picture met with, and to the difficulties of distinguishing these cases from those of typhoid, paratyphoid, and dysentery, apart from a bacteriological diagnosis. I have not had access to the original article to ascertain what types of infection are included in the group called "typho-septic," but it appears very probable that the causative organism in the present series of cases of infection among British troops is the same as that described as *Bac. Erzindjan*.

Most of the cases which are the subject of this paper appear to have been infected in the Bagdad area, although in three instances the evidence available pointed to the place of infection being much farther up the line—viz., at such widely separated places as Kermanshah, Tekrit, and Kifri. For the present it is impossible to say anything about the epidemiology. The probable prevalence of the infection among the native population requires investigation, while it would be of considerable interest to learn whether a similar para. C-like organism has been among the bacteriological findings in Palestine and in other areas of military operations in the Near East.

Summary.

1. A series of inagglutinable organisms culturally and morphologically indistinguishable from *Bac. para B* have been isolated by blood culture in Bagdad during the latter half of 1918, and it is learned that similar findings have been reported in other areas of Mesopotamia.

2. Of the three patients suffering from the infection who died, two of them were clinically regarded as cases of lobar pneumonia. At autopsy the same cocco-bacillus was isolated from the lungs and spleen, and in one instance from the gall-bladder also. Respiratory symptoms were a prominent feature of most of the cases, while the symptomatology and course of the fever were usually not suggestive of an enteric group infection.

3. Serologically all the strains on isolation were inagglutinable to the "enterica" high-titre sera (Lister Institute). After 30 subculturings of the organism agglutination of an atypical character was present in dilutions up to 1 in 1000 of specific para B. serum (Lister), while in comparison a 1 in 10,000 dilution of the same serum led to marked clumping with two stock strains of *B. para B*. Absorption tests tended to confirm those serological differences. The sera obtained from three rabbits immunised with different strains of the bacillus readily agglutinated the whole series of organisms in dilutions of 1 in 5000 to 1 in 10,000; whereas no reaction resulted with the stock *Bac. para B* in dilutions higher than 1 in 250. Equivocal findings were also recorded in tests with a strain of presumed *Bac. aertrycke*.

4. The real identity of the organism is so far undecided. In its behaviour with specific sera it is distinguishable from both *Bac. para. B* and *Bac. aertrycke*, although closely related to both. It has been learned with interest that an epidemic in Turkey and Anatolia has been described as due to a paratyphoid-like organism with similarly atypical serological characters. If the bacillus should eventually be proved not to be a specific organism but to be simply a variety of *Bac. para. B*, the practical importance of its recognition seems to lie in the fact that the recognised high-titre para. B sera fail altogether to agglutinate it on isolation, and after numerous subculturings they react with it, to only a limited extent, while a special immune serum is necessary for its ready identification. Many of the organisms which have been from time to time reported as non-agglutinable or "temporarily inagglutinable" para. B bacilli may belong to this para. C-like group.

It is with pleasure that I acknowledge my indebtedness to Lieutenant-Colonel J. C. G. Ledingham, C.M.G., R.A.M.C., consultant bacteriologist to the Mesopotamian Expeditionary Force, for his great assistance and helpful criticism; while I desire to express my thanks to Lieutenant Colonel H. J. Crossley, R.A.M.C., O.C. — Stationary Hospital, Bagdad, for access to and the use of the clinical records of the described cases.

Bagdad, January, 1919.

[2] Neukirch, 1918, Ztschr. f. Hyg. u. Infektionskrankh. lxxxv., 103.

SOME OBSERVATIONS BEARING UPON THE COMMOTIONAL FACTOR IN THE ÆTIOLOGY OF SHELL SHOCK.

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IN THE LANCET of Jan. 11th, 1919, Dr. C. S. Myers raises three important questions relating to the problem of "shell shock." The first is as to "the existence of distinct commotional and emotional syndromes." I believe that the following experiments, carried out with the assistance of Lieutenant A. Dinsley, R.A.O.C., prior to the appearance of Dr. Myers's article, will prove of interest as bearing upon this point. The conditions under which "shell shock" arises in man render accurate observations so difficult that experiments upon animals seemed advisable carried out so that the weight of explosive used could be kept constant, its nature and composition known but varied at will, and the actual distance of the animals from the centre of detonation measured.

Effects of High Explosives.

When a high explosive is detonated there arises first a sudden terrific blow which exerts a compressing and shattering force upon its surroundings in every direction. This is instantaneous and is followed immediately by an equally sudden decompression, thirdly rapid oscillatory or vibrating movements are set up, which die down only gradually. Each of the three results requires analysis when considering the effects upon living organisms. A further effect is the purely demoralising effect produced by the vibrations outside the sphere within which any demonstrable physical destruction or injuries occur. Evidence will be adduced to show that the Germans arranged their shell-fillings so as to enhance this peculiar effect. This, fully in keeping with other of their methods, might be described as "frightfulness by detonation."

If a high explosive be detonated at a point X three zones may roughly be mapped out around it, their radii depending, amongst other things, upon the weight of explosive.

Zone A is delimited by the extent of obvious gross disruption, and may be termed "the zone of brisance"; within it a crater is formed, barbed wire and other obstacles are blown aside, broken and distorted; animals are killed and usually lacerated; other high explosives immediately detonated.

Outside this is a second zone, B, which may be termed the "zone of decompression," for the disturbances within it seem mainly attributable to this factor, though coarse shaking movements also play their part. In zone B the

gross effects of shattering and disruption are no longer evident; animals placed in it and protected from flying fragments rarely show external signs of injury; only sensitive explosives, whose tonal standard is somewhat similar to that of the primary explosive, detonate.

Beyond this can be named a zone, C, in which the effects of detonation are modified further. The effects upon animals in zone C vary considerably, but as a rule a short transitory state of stupor is followed by a stage of excitement.

Experiments on Fish.

Experiments were first carried out in water, the test animals being fish (perch); a depth charge of 6 oz. of gelignite was used.

Fish in zone A became obviously "hors de combat," showed gross lacerations, and were sometimes torn in pieces.

Fish in zone B after the detonation floated in an almost vertical position, but slightly inclined with their ventral surfaces uppermost, their mouths just protruding above the surface. At this early stage the whole of their bodies were rigid, and if the fish were pushed down to a depth of about two feet they sank slowly to the bottom of the tank and there remained. The earliest sign of animation was violent and irregular spasmodic movement of the opercula and gills. The first reflex which could be elicited from such fish was erection of the dorsal fin upon stimulation of the skin to either side of it. At the end of about half an hour those fish which eventually recovered began to swim when the abdomen was stroked with a piece of stick, but these first swimming movements carried the fish only forward in a straight line, and no turns were made even when an obstruction was met. The movements were made with the ventral surface uppermost and almost flush with the surface of the water. At this stage, then, the fish had lost their power of equilibration, and with this the whole of their orientation in life.

The majority of those which attained the stage of swimming in this way gradually became more active, and eventually, after passing through a side-uppermost posture, began to swim about in a natural manner. In about 12 hours after the detonation all those fish which had not succumbed were, to all appearances, completely normal.

Dissection of the dead one showed definite congestion of the foreparts of the brain, hæmorrhagic points in the mid-brain and basal gangliar region, and generally hæmorrhage in the upper region of the spinal cord and medulla. The gills and other viscera, also the muscles attached to the vertebral column, frequently showed areas of hæmorrhage. Dissection of perch taken at random immediately after the detonation either revealed varying degrees of the above-described changes or else, at macroscopic examination, nothing abnormal was discovered.

Towards the outer margin of B zone and the inner region of C zone the effects upon fish could not be sharply differentiated, the severity of the symptoms and the anatomical findings gradually diminishing with the distance of the creature from X.

Fish well out in C zone dashed about vigorously in a disturbed and excited manner, but though their movements were wild and apparently haphazard they generally made away from X. A few came to the surface and splashed about, but when netted no physical abnormality could be demonstrated, and those returned to the water soon behaved in a completely normal manner.

In considering the effect upon fish of vibrations set up in water one should bear in mind the great development in these creatures of special sense organs directly susceptible to stimulation from such. It is conceivable that the effects of the violent vibrations just described are in part due to excessive stimulation of these special sense organs. If this be so, the shock, though still physical, might be more accurately described as of neurogenic than of commotional origin. It is well known that in man unconsciousness can be produced by purely reflex stimulation, the whole ego being swamped by an excessive flood of afferent impulses which gives rise to a condition of neurogenic shock; there being no "commotio." As I have no evidence which leads me to think that neurogenic shock of this type plays any appreciable rôle in the production of the war neuroses I shall not refer to this aspect of the subject any further.

Experiments on Mammals.

Experiments with mammals (rats and mice) were carried out on land. Perforated zinc cages were used, partly to fix the position of the animals and partly to protect them from flying fragments. These cages were distributed at measured distances around X. The charge was standardised to 3 oz. of explosive.

In zone A cages in and immediately outside the crater formation were simply blown away and distorted, the animals being killed or severely wounded by direct violence; their eyes were bloodshot, and there was often external hæmorrhage from the ear, nose, or mouth. On dissection the alveoli of the lungs were found to be ruptured, and to a variable extent the contral nervous system and other viscera showed hæmorrhagic areas. With the effect in A zone we are not further concerned; the changes would seem to be due to the direct blow of displaced air, which strikes like a solid substance, and to the effect of the exceedingly rapid decompression succeeding this.

Along the inner part of zone B the findings, though similar to the above, were much less in degree. Animals were invariably rendered unconscious irrespective of the extent or nature of the lesions demonstrable, and occasionally were found to be dead, even though no external injury was present; upon dissection the only abnormal finding, to coarse examination, was general capillary engorgement, especially noticeable in the central nervous system and meninges. Whether this indicates that vaso-motor changes play any part in the associated phenomena I am not prepared to say.

Further out in zone B a state of stupor or transitory loss of consciousness, of much shorter duration than in zone A animals, was an almost constant result. During the stage of recovery twitching movements of the limbs were often present, and then the animals, if stimulated by appropriate physical agents, showed massive and exaggerated reflex reactions. For example, the application of a pin-prick to one hinder extremity might be followed either by bilateral contraction of the hinder extremities or even by a generalised convulsion. There was frequently considerable difference in the activity of the reflexes on the two sides of the body—a hemiplegic distribution—but, as a rule, the fore-limbs were more severely affected than the hind and showed weakness and dragging after the latter had recovered normal movements. Reflex responses, though vigorous, died away quickly, but were often succeeded by a weaker repetition even when no fresh stimulus was given. Rapid fatigue of the response on repeated stimulation was a noticeable feature. By dissection no gross macroscopical evidence of internal injury to such animals was revealed, but capillary engorgement, as in animals nearer X, was generally demonstrable.

Animals left alone after this stage had been reached gradually began to behave in a more normal manner, though for a considerable time their conduct, postures, and gaits were awkward. The severity of these disorders varied greatly from animal to animal, which rendered it impossible to deliminate, from biological observations, the precise boundaries of the several zones. Speaking generally, the effect diminished gradually in proportion to the distance of the animal from X.

For some distance beyond what I have termed the C zone, animals crouched down and huddled themselves together whenever a detonation took place; after this state of diminished activity a state of apparent excitement with increased restlessness was the rule. Animals left exposed in this position during a series of experiments invariably crouched down as flat as possible and seemed to be in an absolutely stuporose condition. When liberated they made no effort to run away but remained for a long time in a huddled-up posture. The interpretation of these latter peculiarities of behaviour is difficult. Should fear be allowed as the cause or are other more material factors also at work?

If instead of employing a single explosive at X one detonated a composite charge all the above phenomena became more pronounced, but the increased effect was particularly noticeable in zone C and its immediate surroundings.

Observations on Soldiers.

In this connexion it is of interest to record some observations carried out upon physically and mentally fit men of an "Ammunition Proof and Demolition Section" during the ordinary course of their duties. The staff, drawn from infantry-men with some technical knowledge, was sheltered in a well-protected dug-out about 100 yards from X, the

centre of detonation. In this case X was a large crater formed in the centre of the demolition ground, and contained the official maximum weight for each single destruction—viz., 200 lb.

Although the men had some technical knowledge they did not know the nature of the explosive fillings which were to be destroyed on any given occasion, and it was interesting to study the differing effects of these upon them. Simple single fillings, such as T.N.T., picric acid, and tetryl, rarely caused any of the men discomfort under the conditions described, yet when mixtures such as ammonal (British), amatol (British and German), donarit and glückauf (German) were detonated many of the men complained of unpleasant sensations—e.g., "catching in the throat," "peculiar feelings in the chest," "creepy feelings down the spine," or "weakness of the legs"; others were seen to shake violently and the rate of their pulse and respiration increased.

When separated or layered fillings of different explosives having widely differing velocities of detonation were demolished the effects became greater and several of the men passed into a stuporose condition, followed in some instances by violent shaking and twitching, and in one case by vomiting.

Men thus affected were not fit for duty for the next two or three days, and even then, although fully aware that no real danger attended the demolitions, they seemed to be in a state of mental anxiety and were more readily affected by detonations than previously.

Effects of Detonations of Shells with Layered Fillings.

Examination of German shells shows that in certain of them layered fillings were deliberately employed, although involving more time and labour. Captured German documents reveal the fact that this type of shell was intended for use immediately prior to an attack, and in sectors where the opposing troops were well entrenched. Hence we must infer that the Germans were aware of the peculiar demoralising effects which attend the detonation of these mixed and layered fillings.

Most of those who have been through a severe German bombardment bear witness to the demoralising effect it had upon them, and state how this was succeeded, owing to summation of effect as the bombardment continued, by a sort of "fixed glassy feeling" even when the shell did not detonate particularly close to them. In order to eliminate as far as possible, if not entirely, the psychic factor which in such cases plays its part it is instructive to study cases in which the detonation fell like a "bolt from the blue" upon individuals who were not in a state of tense expectation or fatigue at the moment of the incident.

At the same time one cannot ignore the importance of the predisposing factors, which are highly complex. There is, however, nothing distinctive about them as regards the type of neurosis developed. So far as my observations go the most important of them—viz., fatigue both physical and mental—seem to operate in a general way by lowering the resistance of the individual to all forms of shock, though naturally the individual of poor make-up is more profoundly affected than the robust type.

Commotion from "Direct Concussion."

First to deal with the syndrome in cases where commotion resulting from "direct concussion" without wounding, as in animals exposed in the B zone, is the primary causal factor.

The initial symptom is unconsciousness, often of several hours' duration and possibly persisting for days. Consciousness when first recovered does not remain clear, but the patient passes through a stage of variable duration during which he loses and regains it—the so-called "dipping of consciousness." Some degree of aphasia and sphincter troubles are common at this stage, which is frequently associated with an active delirium in which the patient re-enacts episodes of his military service.

At this time the general condition is one of extreme exhaustion; all mental operations are sluggish and there is great difficulty of concentration. Amnesia both for immediate and remote past is a common occurrence. The voice is often altered, becoming slow, monotonous, and higher pitched than normally. In severe cases these symptoms tend to persist for many months and relapses are easily induced by any form of fatigue.

Clinically the importance of recognising these symptoms is that the prognosis in such cases is much graver than in those giving an exaggerated account of events after they had been thrown down or partially buried. In cases exhibiting the above symptoms prolonged rest, with freedom from strain of all sorts, is essential. Psycho-therapeutic treatment is of little avail except in so far as fixation of symptoms may have occurred in the later stages.

"Indirect Concussion."

Cases of "indirect concussion" corresponding to animals on the borders of the B and C zones demand more careful discrimination. The history is complicated by the fact that there is a tendency on the part of the patient to exaggerate, but careful questioning will overcome this difficulty.

Unconsciousness or stupor of comparatively brief duration is the rule, and the phenomenon of "dipping of consciousness" is not observed. Active delirium is rare, and is not of the occupational type. Amnesia though frequently present is only retrograde, is less extensive, and more readily recovered than in the type of case previously described.

The severity of the symptoms, as well as their duration, is also less, but there is a greater tendency to the superimposition of functional troubles such as paralyses and algesias; these may supervene immediately but, more commonly, they develop later in the course of the disease when the symptoms of commotional origin are recovering. If they are removed by appropriate treatment the patient, after a few weeks' complete rest, generally feels as well as ever. Easy fatigability and diminished power to concentrate the attention are apt to be more persistent symptoms, and although the patient declares himself "quite fit," it is advisable to insist upon a more prolonged period of rest.

"The Last Straw."

Cases in which the neurosis arose as the result of exposure to shell fire in what I have referred to as the C zone are naturally much more difficult to differentiate from those of purely psychogenic origin, and it cannot be said that they are recognisable by a distinctive syndrome. The description already given of men so exposed in the "Ammunition Proof and Demolition Ground" affords a better picture of the onset of the neurosis than can be got from an analysis of the more complicated conditions arising during trench warfare.

In a rather disparaging way any shell detonating outside the A zone is commonly referred to as merely "the last straw," its influence being thus tacitly attributed to purely emotional factors. It is, nevertheless, a last straw which cannot be lightly disregarded, and one is justified in maintaining that a sufficient number of such "straws" will cause the downfall even of the most robust.

It should be remembered that the stability of any explosive is under these conditions diminished, and its sensitiveness so raised that it may eventually detonate. There is no difficulty, then, in conceiving that physical processes, which cause alterations in the direction of *instability* in a relatively simple chemical compound such as an explosive, may, in a similar way, affect the far more delicate colloidal solutions contained in the central nervous system.

Combination of Physical and Emotional Causes.

With cases of purely psychogenic origin, many of whom never reach the danger zone, it is not my purpose to deal. The syndrome closely resembles that with which we are familiar in civil life, though the "current conflict" is usually of a different nature. Psychological analysis reveals the repression and the conflict which is being shirked.

The point which seems to have been universally overlooked is that under the conditions of modern warfare the soldier is constantly subjected both to physical and emotional causes of shock, and that the two factors operate in conjunction. Also whichever factor be in any given case the primary one the individual, once sensitised by either, remains for a long time, perhaps always, hypersensitive to both forms of stimulation, and a vicious circle is thus established.

Although one not infrequently meets with cases in which apparently a single factor has been operative, a careful study of histories in the special military neurological hospitals has led me to conclude that the combined action of the two ætiological factors is much the more common event. If this be so, it is not surprising that those who expect to find either definite commotional or emotional syndromes in the bulk of their patients are generally disappointed.

Conclusion.

I have tried with the aid of the experiments, here briefly set forth, to give a picture of the early syndrome which distinguishes the more severe cases of commotional shock, but as the experiments themselves no less than clinical experience indicates, the symptoms in slighter cases become almost inextricably blended with others which appear identical with those resulting from emotional shock. Hence, though at the two extremes one may with ease deduce the nature of the primary pathogenic factor from a study of the syndrome exhibited, this becomes increasingly difficult as one approaches the intermediate members of the series, and one's judgment is largely determined by the aspect from which one approaches the problem.

INTRACRANIAL LESIONS:

THREE INTERESTING CASES.

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THESE cases, each differing widely from one another, but each having in common a hemiplegia, are recorded together, the first on account of its rarity, the second for its interesting obscurity and want of a true diagnosis, and the third merely as a reminder of what one must be prepared for as an aftermath of the war.

Cavernous Sinus; Thrombosis; Hemiplegia; Pyorrhœa Alveolaris.

Patient, a man, aged 28, was admitted to hospital on March 7th, 1918; long history of pyorrhœa alveolaris. On Feb. 20th seven teeth were extracted from right upper and lower jaws. He developed an alveolar abscess in the right lower jaw with cervical suppuration, requiring incision. On Feb. 27th temperature 104°; repeated rigors and symptoms of septicæmia. The chest was involved in an early broncho-pneumonia of a septic type. Loss of power on left side of body.

On admission patient was extremely ill. His mouth was foul. There was marked necrosis of the lower jaw all along the right alveolar margin, with sloughing of the gums. Both antra were apparently not involved when searched by trans-illumination. The right lung showed signs of broncho-pneumonia, with some pleural effusion; sputum full of streptococci; blood culture sterile. Intense proptoses of right eye, with œdema of lids; marked chemosis and paralysis of sixth nerve. The fundi were normal except for tortuosity and enlargement of retinal veins on right side. There was a little œdema over right mastoid region due to back-pressure in the petrosal sinuses. He was quite conscious, but was almost completely paralysed in face, arm, and leg on left side. Reflexes abolished; no sensory changes; incontinence of urine and fæces.

Intravenous eusol 1 per cent. was given daily for seven days; initial dose 100 c.cm., rapidly increasing to 250 c.cm. Temperature of septic type, 103·5°–104°; respirations, 30–35; pulse, 120–130. After the second injection of eusol the symptoms improved. On the third day the proptosis was a little less; sixth nerve began to recover. On the fourth day the paralysis of the arm was not so complete; on fifth day improvement in leg. The paralysis was never absent, but improved until he could partly move arm and leg. By the seventh day the sphincters were normal. The proptosis decreased up to a certain point and signs of chronic back-pressure began to show in the veins of the lids and in a solid unaltering œdema of the conjunctiva. The right fundus remained as first noted. The chest lesion began to dominate the scene on March 14th; increasing respirations and gradual deterioration; duct parotitis which did not suppurate. By March 16th he was profoundly toxæmic; death on March 23rd from septic broncho-pneumonia and septicæmia.

The points of interest are: 1. The infection and thrombosis of the cavernous sinus by septic absorption from pyorrhœa alveolaris via the pterygoid plexus of veins, through the ophthalmic veins into the sinus. 2. The hemiplegia due to pressure by direct swelling of, or added tissue œdema about, the sinus, on that part of the right crus cerebri containing the motor fibres of the face, arm, and leg of the left side, where it is in relationship with the cavernous sinus. And of the sixth nerve as it lies intimately related to the outer wall of the sinus. 3. The improvement in the hemiplegia and squint and proptosis suggesting organisation of the clot and absorption of surrounding œdema and establishment of collateral circulation. 4. Recovery might possibly have been hoped for had not septicæmia and broncho-pneumonia led on to death.

A Case for Diagnosis; Cerebral Decompression; Recovery.

Patient, a man, aged 43, apparently perfectly healthy, and walking in the street, suddenly gave an articulate cry and fell down in a fit. Syphilis 20 years ago; teetotaller 13 years. On admission to hospital on August 8th, 4 P.M., he presented a further fit. Twitching and fine tremors started in the left hand, passing up the arm, involving face on left side, and ending in left lower extremity; great distress. His tongue was bitten before a gag could be obtained. Pupils dilated and fixed; eyes turned to the left. Consciousness during jactitations and intervals. Reflexes were absent on left side; Babinski's sign negative. Total flaccid paralysis of the left side of face, arm, and leg. No alteration of sensation. Urine normal except for a slight trace of albumin. Distinct œdema of discs, especially on right side. Pulse 120, full, and bounding. B.P.: systolic 130 mm., diastolic 100 mm. Lumbar puncture, fluid under pressure; 20 c.cm. clear fluid withdrawn.

At 8 P.M. patient was deeply comatose and cyanosed, respirations slow, and breathing stertorous. Pulse-rate had fallen to 56, full, and thudding. Pupils equal, semi-dilated, and reacting slightly, and fully dilated in a fit. Complete paralysis as above, but with total loss of all reflexes, including sphincters. Every few minutes patient, although unconscious, was thrown into most violent left-sided jactitation, beginning in face and ending in lower extremity, and lasting 30 to 40 seconds. No external injury was present.

Having diagnosed compression due to a pathological rather than a traumatic lesion with a localising site in the right cerebral hemisphere, I advised decompression. In cerebro-spinal fluid only an excess of small lymphocytes; cells of any kind scanty. This is of extreme importance in later developments.

Operation was carried out at 10 P.M. under chloroform. A large semilunar flap was turned down on right side of skull over motor area and middle meningeal artery. The brain was exposed over area of 2 square inches, including precentral gyrus. No extradural hæmorrhage; middle meningeal artery intact. A normal dura mater bulged; loss of brain pulsation. No subdural hæmorrhage observed, so whole of dura in decompression area was turned down. The brain bulged out rapidly, assuming size of duck's egg; meninges apparently normal; no œdema or suggestion of thrombosis. The skin and fascial flap was then sutured completely. Breathing and pulse-rate immediately improved and he was returned to ward.

On August 9th in the morning there was complete recovery of consciousness and ability to talk. Paralysis remained and reflexes absent; no sensory changes. On the 10th conversation sensible. Partial recovery of lower limb; face and arm paralysed; control of sphincters. On the 11th further recovery of leg with sluggish knee-jerk, arm could be moved, no fine movements possible. On the 12th Wassermann reported strongly positive. On the 13th power in arm and leg increased; facial paralysis almost stationary. Coördination was defective. Steady improvement continued, even in the face, until August 18th.

On the 18th he suddenly had a coarse tremor of the left arm, lasting a few seconds, repeated several times daily; over 25 tremors recorded in a week; otherwise patient is making a good recovery. On the 28th sudden return of violent jactitations affecting arm and then leg, but not face; 24 violent fits in 12 hours. No loss of consciousness in convulsions. Brain at site of decompression very tense and enlarged. Lumbar puncture removed 40 c.cm. of clear fluid under great pressure; fluid similar to last. Complete paralysis of leg and arm followed and lasted two days before return of slight movement in the leg. During this time slight athetoid movements continued in the arm and leg.

From August 30th no further tremors; steady return of power, chiefly to leg, continued. The reflexes were now exaggerated on that side; Babinski's sign negative. On Sept. 20th he could walk with some spasticity of the left leg; arm be raised with difficulty and hand placed on head; grip good. The eyelids could close; lower supply of facial nerve not recovered; fundi completely recovered. Antispecific treatment with iodides has been steadily carried out as far as the stomach will allow.

From this point up to his discharge on Oct. 27th a change was seen in his mental attitude, which had been quite rational. He has been emotional and childish and a little verbose; general health good; able to carry on light work in civil life. He was last seen in February, 1919 (seven months after admission). The mental attitude remained the same; slight improvement in gait and arm power. Tremor of tongue and slight tremor of hands had appeared.

Points of Interest and Discussion.

A man with a strong positive Wassermann is brought in with a left-sided hemiplegia, left-sided Jacksonian epilepsy, and cerebral compression. Where and what is the lesion?

A. At the time of onset of the symptoms the strongest feature was increasing intracranial compression with coincident hemiplegia on the left side, denoting hæmorrhage in the region of the basal ganglia from the lenticulo striate branch of the middle cerebral artery. This would not account for the localised and definite convulsions which essentially belong to a cortical lesion, the two conditions remain uncorrelated.

B. Syphilitic thrombosis of the cortical vessels over the right motor area, with a syphilitic meningitis, might explain both the palsy and the epilepsy. But it does not explain the excessive intracranial pressure leading to profound coma, nor does the normal condition of the meninges and vessels found allow of such a theory.

C. Hæmorrhage into a cyst or a softened gumma in the region of the basal ganglia can only explain the hemiplegia and compression, but not the cortical symptoms. The recurrence of convulsions 21 days after decompression, relieved by lumbar puncture, tends to strengthen the view of further hæmorrhage into such cyst.

D. The abundance of small lymphocytes in the spinal fluid in the early stage, with the onset of changes in the mental attitude later, strongly suggest early general paralysis of the insane which, as is well known, may be ushered in by convulsions and even transient hemiplegia. But this fails to supply the explanation of severe compression sufficient to have been fatal without surgical interference.

My own opinion now is that a combination of (C) and (D) is the only means of correlating the antagonistic symptoms.

A photograph showed the site of decompression and protruded brain on the right side, unfortunately almost obscured by his hair. The position of the leg is voluntary. The arm will be noticed to be still lacking power, and the facial muscles are not controlled.

Latent Meningitis Following Gunshot Wound of the Skull.

Patient, aged 34, sustained in November, 1916, a severe wound by shrapnel of left frontal bone above air sinus. Both tables were carried away, leaving a semilunar opening in the bone 2½ inches long by ¾ inch wide. Laceration of frontal lobe. From the injury up to Feb. 1st, 1919, he had recurring headaches with from time to time vertigo. The fundi did not denote any intracranial pressure.

On Feb. 1st, 1919, he was admitted to hospital, having suddenly had four very severe generalised fits with cyanosis and vomiting; semi-coma between convulsions. He was unconscious to his surroundings on arrival. The fits had no localising features, but were very violent generalised clonic convulsions. In the period of quiet a violent fit could be elicited by firm pressure on the scar. Fundi normal. All reflexes present, but sluggish. The scar was very thick, and firmly adherent all round hiatus in bone. The tissues about the scar were slightly œdematous, simulating the puffy tumour of Pott. The convulsions continued frequent and violent. The diagnosis acute spreading œdema of the meninges was made, and operative measures advised.

Operation.—Under chloroform the old scar was rapidly excised and site of fracture exposed, well in front of motor area. The hiatus in the frontal bone was filled up with dense scar tissue, consisting of brain tissue, organised blood clot, and the remains of the meninges. The whole was markedly œdematous; cerebro-spinal fluid more abundant than usual. A trephine disc was removed from the sound bone just behind the fracture and the tissues adherent to the ragged bone carefully separated until the brain and meninges were free from the skull. Bone was then removed until a decompression over 2 inches square had been effected. The organised clot and scar tissue were carefully excised from the frontal lobe, hot saline freely used, and the wound closed except for drainage.

On recovery from the anæsthetic two hours later patient had a violent convulsion, followed by a state of acute cerebral irritation, which was continuous and had to be controlled by chloroform anæsthesia. This stage in about ten hours gave place to intervals of lethargy alternating with violent fits. Twenty-four hours later compression symptoms came on and patient developed hemiplegia of the whole of the right side. Coma and death ensued 48 hours after admission.

Post mortem.—The frontal lobe on the left side showed marked destruction of old standing, with a dry cavity in the deeper portion suggesting the site of an old abscess which had undergone absorption. On the left side of the brain there was a marked basal meningitis. The meninges were in a state of acute œdema, especially marked on the left side. No undue localising pressure was noted on the left motor area to account for the increasing paralysis on the right side.

This case illustrates the guarded prognosis necessary in war wounds of the skull. In brief, the majority of such wounds are fatal on the field. Those brought under the surgeon's care either remain clean and recover or become septic and die within a fortnight from suppurative lepto-meningitis or encephalitis or end with a hernia cerebri, which remains a menace for all time. This man had apparently completely recovered, with no hernia cerebri or bulging of the brain tissue. Yet over two years elapsed before the latent infection flashed up, ending fatally in an acute generalised œdema of the meninges and a definite localised basal meningitis.

Plymouth.

COLECTOMY.

BY JAMES TAYLOR, F.R.C.S. EDIN.,
MAJOR, R.A.M.C.; DISTRICT CONSULTING SURGEON, ALDERSHOT COMMAND.

AT present the question of intestinal stasis is much before the profession. The medical journals constantly refer to it, and even the public press has articles on this subject. We are recognising more and more that a great many ailments have their origin in the intestine. In many cases diseases are the direct mechanical result of the delayed passage of food, but much more suffering, and a much greater variety of sickness, is produced by toxins from fermentive processes among the accumulated intestinal contents. Other diseases are produced by germs directly attacking organs after their resistance has been lowered by intestinal toxæmia. The mechanical and fermentive processes are always more or less associated. They act and react on one another, but sometimes one and sometimes the other is the dominant factor in the production of any particular disease.

The treatment of intestinal stasis rests with the physician, but a fairly large proportion of cases get beyond his control and can only be relieved by surgical measures. Many cases only reach this stage because all treatment has been neglected until serious mechanical obstructions and marked toxic changes have taken place.

The most striking results of surgical treatment are seen in the toxæmic cases. Nothing is more impressive than to see a large thyroid shrivel to normal dimensions, or a Bright's disease entirely clear up after removal of the colon. Six years ago after performing an ileo-sigmoidostomy on a woman with inveterate constipation the feeling of well-being which followed was surprising. Within 24 hours she felt entirely different, and the change was obvious to the observer. Before the operation the odour of her breath made it unpleasant to be near her, in spite of the utmost care of her mouth by the nurses. Within a day from the operation this had entirely disappeared, and her muddy complexion became clear incredibly soon. The removal of a controlling appendix or the division of a controlling band will often produce remarkable improvement, but the results which impress one most occur after the more radical operations, and one sees the most wonderful recoveries after the removal of the large bowel.

Illustrative Cases.

In this paper I propose to describe some cases in which the changes in the colon itself, resulting from stasis, were such as to demand its removal. They illustrate the effect of the irritating contents on the bowel.

CASE 1.—The colon was not actually diseased, but, being overloaded, had sunk down till almost all the ascending, transverse, and descending portions were in the pelvis. The patient, aged 30, came under my care suffering from severe indigestion. Constant pain and vomiting after food; bowels always constipated. The symptoms were those of gastric ulcer; physical examination confirmed this. When the abdomen was opened an old healed ulcer was found at the pylorus; obstruction not very great. The colon was as described, and obviously was the essential cause of the trouble. The large bowel from cæcum to lower part of pelvic colon was removed, and the end of the ileum joined to the end of the divided sigmoid.

CASE 2.—A boy, aged 18, complaining of abdominal pain for three months. Pain in spasms; during spasms a considerable swelling appeared in right side of abdomen, just

below umbilicus. It was movable and tympanitic, and only slightly tender. At times it would disappear altogether, and the pain would pass off. He was constipated; occasional attacks of vomiting; slight distension of whole abdomen. A diagnosis of chronic obstruction was made, and I thought he had probably a tuberculous cæcum. When the abdomen was opened the end of the ileum was dilated to the size of a normal stomach; walls greatly hypertrophied. In cæcum and beginning of ascending colon was a firm elastic swelling resembling chronic intussusception. The dilated end of the ileum and the whole colon round to its pelvic portion were excised, and an end-to-end anastomosis between ileum and sigmoid made. On examination of the specimen the lumen of the cæcum and lower ascending colon was so narrowed that a finger passed with difficulty. The subserous and submucous coats were greatly thickened and the mucous membrane was thrown into folds, which gave the appearance of a large-celled honeycomb. Professor S. G. Shattock very kindly examined the specimen and pronounced it to be a case of colitis polyposa.

CASE 3.—Six years before coming under my care patient suffered from constipation; appendix removed; condition did not alter during next four years. Then pain began on right side of abdomen; blood in stools. A few weeks later diarrhœa began to be troublesome; much blood and mucus passed. He was in hospital at various times during the next two years, once for five months. When I saw him first he had been under treatment for six weeks without improvement, and I was asked by the physician to perform a cæcostomy. Diarrhœa was constant, as many as 12 motions a day; patient extremely thin and weak. The cæcum was opened and irrigation started. He improved up to a point, but relapsed when cæcostomy opening was allowed to close. More radical treatment was decided upon. The whole colon down to within a few inches of the rectum was excised. The patient stood the operation well, and gradually improved. A certain amount of diarrhœa still resulted from diseased condition of rectum. Cultures were made from the stools, and a streptococcal vaccine was given; this with protargol injections hastened recovery. He was discharged from the Service fit for light employment.

CASE 4.—Patient, a woman aged 53; intestinal obstruction for ten days. There had been much abdominal pain, occasional vomiting, and repeated enemata had only resulted in a very little flatus being passed. The abdomen was enormously distended and somewhat tender. On laparotomy there was an escape of free gas from the peritoneal cavity; free fluid was present in pelvis. The large and small intestines were greatly distended, and a malignant growth was found in middle of pelvic colon. Several stercoral ulcers in cæcum; one had perforated. The cæcum was brought out of the wound, perforation closed, and a Paul's tube tied into the most healthy part. A large rubber drain was then passed down to the bottom of the pelvis, to be left in for several days.

The patient was very ill for about a week; distended bowel very slowly recovered tone, and expelled its contents. After three weeks the abdomen was quite flat; bowels moving freely through artificial anus. Under stovaine and ether anæsthesia an incision was made round the cæcostomy opening, two narrow flaps of skin turned up and stitched together face to face so as temporarily to close the opening. The field of operation was then again thoroughly cleansed, and the abdominal cavity freely opened. The whole colon, except a few inches of pelvic portion, was resected, with about 4 ft. of lower ileum hopelessly matted together as a result of the perforative peritonitis. An end-to-end anastomosis was made, and a tube passed up through the rectum to a little above the line of intestinal suture. Most excellent recovery; healing by first intention.

Eighteen months afterwards the patient is in better health than she has enjoyed for years, the bowels move easily twice a day, and she can lead a normal active life, including horse-riding. There is no evidence of recurrence.

CASE 5.—This is a similar case, a malignant growth in the same situation causing acute obstruction, which had to be relieved in the same way with colectomy a fortnight later. No perforation; only about 8 in. of small intestine sacrificed. Recovery excellent, but it is too soon to say whether any recurrence is going to take place.

CASE 6.—A patient had had a transverse colotomy for gunshot wound of pelvis involving rectum. When the rectum had healed the colotomy opening had to be closed. So much of the transverse colon was damaged that it was going to be difficult to bring the ends together after removal of injured portion. The ascending and descending colon were removed as well and an end-to-end anastomosis made between the ileum and the pelvic colon. Recovery excellent.

These six cases are the only complete colectomies I have had the opportunity of performing. I was surprised at the way the patients stood the operation, especially in the two cases in which so much delay was caused by the precautions to avoid contamination of the wound from the colotomy opening. The rapid improvement in general health was also striking. I have seen four of these cases recently and, except the case with the ulcerative condition of the rectum, there was no trouble with diarrhœa, the bowels only moving about twice a day. One hears that these patients are always troubled with looseness of the bowels, but that has not been my experience. Even the patient who lost 4 ft. of ileum as well as the whole colon has had no trouble of this kind. Yet another patient in whom I removed about the same length of intestine—8 ft. of small intestine, cæcum, and ascending colon—has suffered from troublesome diarrhœa since. This seems to indicate loss of small intestine as more likely to cause frequent motions than loss of colon.

Sir Arbuthnot Lane is most emphatic that in cases of obstruction from a growth in the colon the whole large bowel, including the tumour, should be removed at the primary operation. The tube which is then passed up through the rectum into the end of the ileum drains the small intestine directly and at once. It seems the ideal method, but I think could only be done by a surgeon of his skill and experience. In my two cases I felt that the patients would not stand more than I did at the first operation, and I also anticipated having great trouble in making my anastomosis tight when the ileum was so much distended. On the other hand, I almost lost my first patient from toxic absorption from the colon, for it took nearly a week to empty itself through the colotomy opening, and the difficulty of doing the radical operation afterwards was greatly increased by the presence of a fæcal fistula.

Partial Operations.

Attempts to relieve patients by partial operations are not very successful. Two recent cases bear this out, and are rather instructive.

CASE A.—I saw this patient, aged 38, in consultation in the country. She had been an invalid for many years, much troubled with indigestion, and not able to do more than move about quietly in her garden. Thirty-six hours before I saw her she was seized with sudden severe abdominal pain and vomiting. When seen by her doctor there was no marked tenderness or rigidity, but enemata failed to produce any result; nothing had passed by bowel since onset of pain. I found the abdomen much distended and somewhat tender in its lower part. Pulse weak but not rapid. Immediate laparotomy was decided on. The abdomen was opened in the middle line and a large gangrenous cæcum presented in the wound. Examination showed extreme visceroptosis, and a volvulus of an extremely mobile cæcum had taken place. This portion of bowel was greyish black in colour, had lost its lustre, and rupture seemed imminent. I first incised the cæcum and cleared out the contents; the torsion was then easily uncoiled. I had to remove the colon round to the middle of its transverse portion before a moderately healthy part was reached. I was much in doubt as to whether I should resect the whole large bowel, but decided it was better not to have any raw surfaces on the left side of the abdomen, as the peritoneum was somewhat infected from the gangrenous gut. An end-to-end junction was made therefore between the ileum and the transverse colon. Patient made a good recovery, but she has not put on any more weight, and does not seem to have improved in general health, as I should have expected had the ileum been drained directly into the pelvic colon.

CASE B.—This is a very instructive case, the notes on which Sir Arbuthnot Lane has very kindly allowed me to publish. The patient, aged 36, had suffered from constipation for many years, and about four years before she came to me began to have considerable abdominal discomfort. She was supposed to have appendicitis and had this organ removed; it was noticed that the colon was badly prolapsed. She was no better after this treatment and three months later laparotomy was performed by another surgeon, and the cæcum, ascending and beginning of the transverse colon resected. She was fairly comfortable for the next 18 months, when constipation again became very troublesome, and after various kinds of medical treatment, the abdomen was opened for the third time. Some adhesions were separated, and a loop of small intestine, which had been acutely bent on itself, was sutured to the abdominal wall. She nearly died of ileus, and such was her suffering during the next month that operation was decided on again. On this occasion a lateral anastomosis between the ileum and pelvic colon was performed, and the patient was told that when she had recovered sufficiently the segregated loop would be removed. However, at the end of another year the operator refused to do this, as adhesions had made the operation too difficult.

At this stage I saw her for the first time. She was leading a miserable existence. Large doses of aperients were necessary every day, and often enemata as well. She was in almost constant pain. At times a distended loop of bowel could be seen standing out with waves of peristalsis passing along it. Opaque meal examination showed very marked delay in the small intestine. Most of the contents passed slowly through the ileo-sigmoidostomy opening, but a small quantity travelled through the side-to-side anastomosis made between the end of the ileum and the end of the transverse colon. By this means it reached the splenic flexure, and was held up here for about 48 hours. Although she was taking aperients, it was not till the fourth day that the opaque meal reached the rectum. A barium enema showed a very long and distended pelvic colon, and the fluid could not be forced beyond the splenic flexure. It was obvious that she was suffering from chronic obstruction, which might become acute at any moment. As a radical operation was going to be extremely difficult, I advised her to have it done by Sir Arbuthnot Lane, and I had the privilege of assisting him with it. After carefully separating the adhesions, the very long pelvic colon was divided near its lower end. The bowel was freed and removed from below, upwards, until the ileum above the higher anastomosis was reached. An end-to-end anastomosis between the ileum and the pelvic colon was then made.

The patient had a much happier convalescence after this operation than after any of her previous ones, and her pain was entirely relieved. She is now steadily recovering her strength. Had a complete colectomy been done in the first instance she would have been saved much suffering and four years of invalidism.

Conclusion.

Although my experience of colectomies has been somewhat limited, I feel it is worth while publishing notes on the few cases done because there is a very general belief that many patients do not recover from the operation, and that those who do are no longer capable of leading an active life. Operation deaths do occur, but usually because the patient is suffering from a serious organic lesion, and an operation is being done that one may give him the only chance of recovery. One must expect misfortunes sometimes when patients with serious kidney disease are submitted to operation, but the fact that my first six cases of colectomy were recoveries seems to show that the risk is not very great when no very vital organ is seriously involved.

I feel assured that improving the drainage system produces wonderful results, and often efficient drainage cannot be obtained without removal of the large bowel. One sees the effect of improved drainage in those patients with peptic ulcer who have had a gastro-enterostomy performed, and their ileal control freed. The complexion clears, the tongue becomes clean, and the excretion of foul-smelling toxins by the sweat glands no longer takes place, and yet in these cases only slight relief has been given to the obstructed alimentary tract. I feel sure that the great improvement in health often following appendicectomy is not due to the removal of a diseased organ, but to the excision of an appendix which has been controlling the end of the ileum.

ANEURYSM OF THE HEART WITHOUT SYMPTOMS.

BY CLAUDE WILSON, M.D. EDIN.

ANEURYSMAL dilatation of the cardiac wall is rare, though, perhaps, not so rare as supposed, for in many cases of sudden death from heart failure no autopsy is made. The condition cannot be diagnosed during life, and in very few cases has it ever been suspected. It has been found as a solitary lesion in an otherwise healthy heart, but is commonly associated with widespread changes—syphilitic, sclerotic, or fatty. The immediate cause is probably in all cases the blocking of a branch of the coronary artery, leading to atrophy of a limited area of the heart wall.

Occasional cases have been published in the medical literature of many nations. In English there are two well-known monographs on the subject: by Dr. Wickham Legg[1] and Dr. D. G. Hall.[2] In neither of these is the clinical history dealt with very fully; but it may be stated generally that in the great majority of cases the usual signs and symptoms of cardiac enfeeblement have been present, while angina is a fairly common symptom. But in a certain proportion of cases the severer symptoms of cardiac weakness have been singularly wanting, and I have traced one case, recorded by Dr. F. M. Hughes[3]—in addition to my own—in which there were no symptoms at all.

The patient, a dock labourer who had never had any cardiac symptoms, had worked hard all his life, and had several times been passed as fit for work by doctors. He had had no occasion for medical treatment of any kind during the last 15 years of his life; he walked six miles to his work two days before his death, and was able to continue his arduous labours after his first slight feelings of distress, until on the third day he suddenly dropped dead at the age of 49. At the autopsy the pericardium was found full of blood clot, and in the anterior wall of the left ventricle—near the apex—was an aneurysm the size of a walnut, which had ruptured. The valves and aorta were healthy, but the microscope showed degeneration of the myocardium in the area of the aneurysm and fatty degeneration of the whole heart wall. The other organs were healthy, and there was no evidence of syphilis.

Account of a Case.

The case under my care is not less remarkable.

The patient, aged 60, was married at 36; three children, all grown up. Pale complexion which made her look somewhat fragile, but with a wonderful record of health; could not remember ever having been ill. Cheerful disposition. Very active worker at home and abroad. Good walker: could take a 20-mile walk, and go up the hills as fast as her daughters. This record ceased on Sunday morning, Sept. 8th, 1918, when after breakfast, for the first time in her life, she felt somewhat sick. However, she went to church—a mile walk, mostly uphill—and ate the usual substantial meal on her return. At 2 P.M. some visitors turned up. She entertained them, but was glad when they departed at 3.30 as she then felt sick and ill and said she would go to bed. At 3.45 I received a message from her husband asking me to see her at once, and I went at once.

I found her sitting up in bed, complaining of a pain behind the sternum, and of nausea. Almost immediately she was violently sick and vomited her undigested meal. She then said she felt better and laid down, but the nausea continued and she still felt some pain. Her pulse was regular—about 75—and the heart sounds normal. I concluded it was a gastric attack, and that she must have eaten something that had disagreed. At 7 P.M. I telephoned and heard that she was better, but still retching from time to time. Later she told her husband, who is a somewhat restless sleeper, that she thought she would sleep better alone. He consequently left her at about 11 P.M. and slept in the adjoining room. At 4.30 he awoke and heard her "coughing." He went into her room and found her sitting up in bed, with a basin in her hands, endeavouring to vomit. Hardly had he reached her side when she gave a gasp and fell back dead. At 4.45 A.M. (Monday, Sept. 9th) my telephone woke me up, and I was informed that she was dead. I was at the house before 5.30, when I learned the history of the night, and made sure that life was extinct.

Necropsy.—In the afternoon of the same day I made a post-mortem examination. The abdominal contents were normal, and in the thorax attention was immediately centred on the bulging pericardium. On puncturing it blood gushed out, and the sac was found to be full of blood, partly liquid and partly clotted. The heart itself was small, and the walls rather thin and pale. On the surface of the left ventricle, about an inch above the apex, was a dark circular patch rather smaller than a shilling, with a small rent in the centre. On section, the patch proved to be a collapsed aneurysmal dilatation; the central portion, where the rupture had taken place, was hardly thicker than brown paper. The obvious difference in colour and texture of the aneurysm from that of the rest of the ventricular wall seemed conclusive evidence that the lesion was one of old standing. In other respects the heart appeared normal. No microscopical examination was made.

I presume that what occurred on the Sunday was a pinhole perforation, allowing of the oozing of droplets of blood into the pericardium, thus occasioning widespread vagal disturbance, and that the larger rent took place just before death.

The occurrence of such cases is valuable evidence of the astonishing capacity of some badly damaged hearts, and it is surely fortunate that these conditions cannot be diagnosed. Both of these patients lived useful lives to the very end. As

[1] The Bradshaw Lectures, 1883 (Med. Times and Gazette, 1883, ii., 199).
[2] Edinburgh Medical Journal, 1903, p. 322.
[3] THE LANCET, 1914, i., 533.

the lesion could not have been cured, any extra lease of life secured by rigid limitation of effort would have been dearly purchased at the price of invalidism, coupled by continual apprehension.

Tunbridge Wells.

FLAVINE IN THE TREATMENT OF COMMINUTED FRACTURES OF THE JAWS AND ACUTE SEPTIC STOMATITIS.

BY H. WATSON TURNER, M.R.C.S., L.D.S.,
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THE treatment of fractures of the jaws due to shrapnel or gunshot presents a complicated problem, special difficulties being extensive comminution of bone and laceration of soft tissues, and the high degree of septic infection. Provided the patients came under treatment before extensive necrosis of bone had occurred—i.e., not later than seven to ten days after injury—the results have been highly favourable in many cases with very severe damage and infection. I attribute my success in great part to the use of flavine, which has been shown to possess powerful antiseptic action in dilutions relatively harmless to tissue elements.

Method of Treatment.

The following method was adopted as a general practice. After the patient had been anæthetised a tube was passed into the larynx and the anæsthetic administered by means of it; the throat being plugged with gauze there was no possibility of foreign bodies passing downward. Teeth in the lines of fracture were removed wherever possible, and also every septic tooth and root. In dealing with fractured bone where comminution was extensive, it was impossible to decide which fragments were viable and which were necrotic. Accordingly I made a rule to leave all bony fragments undisturbed and to bathe and soak the whole fractured area for five to ten minutes with 1 : 1000 flavine solution, disturbing the parts as little as possible, so as to avoid mechanical injury to tissues already devitalised. The external wound was cleansed with flavine solution and dressed with gauze soaked in flavine, which was also used to pack lightly any sinuses. In fractured mandible the jaw was supported with a knitted chin support. Subsequent to this the treatment followed on the usual lines; cap-splints were fitted to maxilla and mandible and were wired together. Cleanliness of the mouth was ensured by frequent syringing.

I am convinced that the favourable results were largely due to the early treatment with flavine, which, hastening the extinction of septic infection, yet left unimpaired the vitality of the osteogenetic tissue. Had the living bone been destroyed in the course of treatment such complete bony union as occurred in these cases could not have been obtained.

Illustrative Cases.

The following notes indicate the results in two particularly severe cases:—

CASE 1.—Pte., admitted Sept. 3rd. 1918. The X ray photograph showed very extensive comminution of bone; there was much destruction of soft tissues and profuse suppuration. After treatment on the lines described there was practically reconstruction of the mandible, as shown in a photograph taken on March 25th, 1919.

CASE 2.—Australian Lt. There was a fracture of the right maxilla with involvement of the antrum, which was filled with pus. The soft palate was badly lacerated, and the hard palate extensively comminuted; the mouth was very foul. The parts were cleansed with flavine and the antrum washed out with the solution, then all the soft tissues were soaked with flavine; all broken teeth were removed. At the close of the operation the soft palate was stitched up. It is to be specially noted that although the wound was completely closed, and no provision was made for drainage, the parts healed excellently and there was no recrudescence of sepsis.

Acute Stomatitis.

The frequency of acute stomatitis of all degrees up to actual gangrene has been a striking feature among soldiers. These acute infections were usually superadded on a chronic septic condition of the mouth. When such cases first come under observation the gums are exceedingly tender and painful, and there is often extensive sloughing and an exceedingly foul odour. It is essential to get rid of the acute inflammation before instituting thorough operative measures.

The following method of preliminary treatment has yielded excellent and rapid results:—The mouth is syringed out with flavine 1 : 1000, special attention being paid to all pockets. Then gauze soaked with flavine solution is lightly packed into the angle of the cheek and all round the gums, and is retained in the mouth for 20 to 30 minutes. This procedure is repeated thrice daily.

As regards the results, not merely is the application painless, but it leads quickly to relief of pain and to subsidence of the acute inflammatory condition. Further, in several cases where the mouth was so foul that one could readily detect the bad odour at a distance of several yards, 24 hours after commencing treatment with flavine the breath has become quite free from smell.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

THE USE OF BISMUTH AND IODOFORM IN THE TREATMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA.

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EARLY in 1916 I was introduced to the merits of bipp[1] by its inventor, Professor Rutherford Morison. The results he was attaining by its use in bone surgery impressed me very greatly, and I put into operation his suggestion of using it in mastoid work. The sequel more than justified our expectations, and encouraged me to use a powder of bismuth and iodoform in the same proportions as in bipp in certain cases of chronic ear suppuration.

Types.—Chronic ear suppuration may be divided roughly into the following types: 1. Those in which the suppuration is not confined to the tympanum, but has extended to the mastoid or the labyrinth. Although in acute suppuration the whole middle ear cleft is generally involved, this by no means holds good in the chronic stage. It is a common experience to observe the relief of mastoid pain and tenderness after tympanic drainage is established in acute cases, and it is equally common to open a healthy mastoid antrum when operating for the cure of chronic suppuration. 2. Cases in which naso-pharyngeal or tubal sepsis is responsible for the continuance of the suppuration. 3. Those in which the bony tympanum is carious. 4. Those in which the suppuration is limited to the mucous tympanum.

It is only in cases belonging to the last group that cure may be hoped for by local conservative measures, but such cases are extremely common. The usual method of treating them with syringing, mopping, "drops," &c., is discouraging. One is so completely at the mercy of the patient's attendants, and the effect of the "drops," even when they are correctly instilled, is so transitory, that it is difficult to expect a cure. The use of "bip"[2] to a great measure removes these handicaps.

Technique.—1. Establishment and maintenance of thorough drainage. In the generality of cases that is already present, very many "chronic ears" presenting but a rim of membrane or even none at all. 2. Removal of crusts, dead epithelium, and all morbid material with hydrogen peroxide. 3. Thorough cleansing of meatus and tympanum with spirit, applied on a wool-carrying applicator, and allowing to dry. 4. Covering the tympanum with bip. The powder is blown in with a fine-pointed, slightly curved, powder-blower through a large speculum. In cases with profuse suppuration I have not found that more than three applications a week are necessary, and in milder ones a weekly application fulfils

[1] Bismuth, iodoform, and paraffin paste, containing bismuth and iodoform in the proportions of 1 of bismuth to 2 of iodoform.
[2] Bismuth and iodoform powder.

requirements. As the suppuration lessens the need for frequent sittings diminishes, of course.

Results.—I have treated well over 200 cases on these lines, and while 100 per cent. of cures cannot be claimed, the results have, in the great majority of cases, been so satisfactory as to justify my recommending the method. The curative effects may be attributed to two causes: 1. The continual antiseptic action of the nascent iodine, which is being constantly formed from the iodoform. 2. The prevention of putrefaction in accumulated secretions by the same agency. The factor of putrefaction is an extremely important one in chronic suppuration.

Long duration of the condition is no bar to success. Many of the cases successfully treated have suffered seven and eight years. The presence of a polypus need not always cause dismay; it is not conclusive evidence of bone disease, but its removal is necessary before thorough treatment can commence.

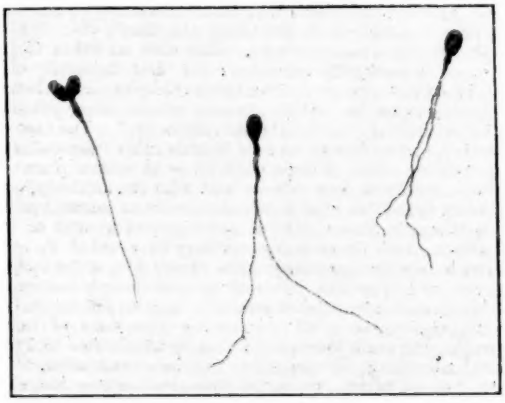
Queen Anne-street, W.

A NOTE ON DUPLICATION IN HUMAN SPERMATOZOA.

BY S. R. TATTERSALL, M.R.C.S., L.R.C.P.

IN spermatozoa from certain of the lower animals partial doubling of the tail has been described as an occasional occurrence; but similar observations in the human subject seem to be at present wanting. In the case to which this note refers, the patient was a man, 25 years of age, suffering from spermatorrhœa. The microscopic examination was made upon films fixed by heat and stained for ten minutes in hot carbol-fuchsin. This was found to stain the tails of the spermatozoa extremely well, but at the expense of some detail in the head and middle part.

The greater number of the spermatozoa are normal, but in a few instances one head is furnished with two distinct tails. The tails are quite separate and distinct as far forwards as the posterior end of the middle part, with which they join. The position of the two tails varies widely. Some lie close together, while others diverge at varying angles. The



Human spermatozoa, showing two-headed and two-tailed varieties. 1/12 in. oil-immersion. (Figure reduced.)

possibility of two heads and middle parts overlying each other has to be excluded, but the head-cap of the two-tailed forms is not less translucent than the head-cap of normal sperms. In each case the middle-piece is not increased in thickness. The tails have been of equal length with the exception of one sperm, where they differ markedly. The proportion of two-tailed to normal sperms is estimated at about 1:750. Those sperms which have been observed have all been in thin parts of the film where confusion with the tails of neighbouring spermatozoa may be with certainty excluded.

A second type of abnormality was also observed. One or two spermatozoa were furnished with two heads and one tail. The angle made by the axes of the heads varied from about 60° to about 170°. They are much less frequent than the first type described, the estimated ratio to normal spermatozoa being about 1:5000. In a few of these two-headed spermatozoa the middle part appears of normal thickness, but in many it is slightly thicker, though not denser than that of the normal spermatozoon. The genuineness of this type is, however, not indisputable. Several instances have been observed where with divergent heads, the middle parts and tails have adhered very closely, indeed diverging only for about the last eighth of their length. Although these latter are probably spermatozoa adherent to one another, the possibility of their being fused by the middle part may be borne in mind.

No abnormality has been found in the sexual history of the man's family. There has not been a marked preponderance of one sex among the children born, nor has there been an instance of twins or abnormal children for two generations back. The drawings were made under Professor Shattock's supervision, and he informs me that the occurrence of two-headed spermatozoa in the seminal fluid of man was recorded by Major F. Smith in the *Journal of the Royal Army Medical Corps* (Vol. XI., 1908), though without either particulars or drawings: the individual is stated to have regularly procreated twins.

Schäfer[1] states that in animals the extremity of the tail may be split into two or three fibrils, which can sometimes be traced along the whole length of the tail. The drawings accompanying this communication were made with a 1/12 in. oil-immersion objective, and a 10 x eyepiece.

Since the above observation was made I have found similar two-tailed forms in the fluid from a spermatocele. The opalescent fluid, which contained great numbers of spermatozoa, was diluted from normal saline, and from this preparations were made as above described.

St. Thomas's Hospital.

CASE OF SMALL-POX SIMULATING ACUTE APPENDICITIS.

BY J. K. HAWORTH, M.D., B.S. DURH.,
CAPTAIN, R.A.M.C. (S.R.); SURGICAL SPECIALIST, 5TH LUCKNOW DIVISION.

THE following case of small-pox appears to illustrate the difficulties of diagnosis in acute appendicitis.

Mrs. —— was admitted at 10.30 P.M. to Family Hospital, Lucknow, complaining of acute pain in her right side, with vomiting and fever—the Murphy sequence. Her history was that she had been unwell for three days, but only on the day of admission had she thought it necessary to call in medical advice. On admission she was in great pain, temperature 104·6° F., pulse 100, with vomiting. The rate of breathing was slightly increased. Her abdomen was not distended; she was very tender over the appendix area, with only slight rigidity. Chest normal. The case at first appeared one of acute appendicitis, but it was decided, not without considerable anxiety, to delay operation till next morning, as her general condition and abdominal signs did not seem quite to agree. Next morning she developed a typical small-pox rash with some hæmorrhagic spots. Her temperature dropped. The pain disappeared and the course of disease was uneventful to recovery.

In striking contrast to this case on the next day a patient in hospital developed almost exactly similar symptoms and was operated on in less than 12 hours from his first attack of pain, and a black gangrenous appendix was removed.

[1] Essentials of Histology, 1914, p. 389.

A PSYCHIATRIC CLINIC FOR CARDIFF.—A conference was recently held at the City Hall, Cardiff, attended by Sir William Byrne and Dr. C. H. Bond, on behalf of the Board of Control, at which the setting up of an in- and out-patient department for early mental cases in connexion with King Edward VII.'s Hospital was fully discussed. The proposal is, in the first instance, for a psychiatric clinic of 50 beds within convenient reach of the infirmary, with facilities for special examination and psychotherapy, as well as lecture rooms and laboratories. The out-patient department, it is expected, will be located at the King Edward VII.'s Hospital. Sir William Byrne, in expressing the sympathy of the Board of Control with the scheme, outlined the main features of the amending Bill to the Lunacy Acts, the draft of which is now being considered by the Government.

Reviews and Notices of Books.

The Story of English Public Health. By SIR MALCOLM MORRIS, K.C.V.O. Pp. 166. *Infant and Young Child Welfare.* By HAROLD SCURFIELD, M.D. Edin., D.P.H. Camb. Pp. 166. *Food and Public Health.* By WILLIAM G. SAVAGE, B.Sc., M.D. Lond., D.P.H. Pp. 156. *Housing and Public Health.* By JOHN ROBERTSON, C.M.G., O.B.E., M.D., B.Sc. Pp. 159. *The Welfare of the Expectant Mother.* By MARY SCHARLIEB, C.B.E., M.D., M.S. Pp. 152. (English Public Health Series, edited by Sir MALCOLM MORRIS.) London: Cassell and Co., Ltd. 5*s.* each volume.

THE editor and the publishers are to be congratulated upon the timely appearance of this series of books dealing with the present problems of public health. It is designed especially to meet the needs of members of local authorities, district nurses, health visitors, and the lay public generally in so far as this public is interested in its own welfare. We hope that where that interest is lacking these books will do much to supply the want, for legislation can never be effective in public health unless it is supported by an intelligent body of opinion.

Sir Malcolm Morris, who also edits the series, is responsible for the first volume—a short history of the growth of the public health movement from the work of Edwin Chadwick, which culminated in the passing of the Public Health Act of 1848 down to the establishment of the Ministry of Health. The functions of the principal central health authorities in the old regime are dealt with serially; two chapters are devoted to the questions opened up in recent years by discoveries of the nature of the infections and the spread of venereal disease, and finally the Ministry of Health is invoked to embrace all the measures taken by old authorities as well as to deal with the new problems as they arise.

The welfare of the infant is viewed by Dr. Scurfield from a very broad standpoint, and is exactly the kind of writing which is most needed. In his introduction he reviews the doctrine of the survival of the fittest as becomes a disciple of Benjamin Kidd, and wonders how many useful citizens the Spartan Council of Elders ordered to be thrown down the cavern of Mount Taygetus. If we are to assist in the survival of the fittest it must not be by neglecting the weak, but rather by paying attention to eugenics. Dr. Scurfield recognises the limitations necessary to the application of this science, but does powerfully plead for some endeavour to prevent the marriages of syphilitics, epileptics, alcoholics, mental defectives, and persons suffering from an infectious stage of tuberculosis. From its heritage the writer passes to a consideration of the baby's environment, and thence to a very practical review of the details which make its life worth living. This is a volume which every mother and every intending mother ought to study.

When the second edition of "Food and the Public Health" comes to be published it is reasonable to suppose that a great deal of new matter will have to be introduced into the first chapter. In the present edition the food constituents are classified and the common foods are considered as regards their caloric value and digestibility. But the newer knowledge acquired during the war of the effects of certain foods in counteracting fatigue and the results of the deprivation of others through war conditions—all this is perhaps not yet sufficiently crystallised to find expression in popular language. The remaining chapters deal mainly with the adulteration and infection of food, and are illustrated by half-tone plates.

Dr. John Robertson writes as one having authority, for he depends mainly upon his own experience as a medical officer of health in one of our most crowded cities, and quotes but seldom from the works of others, though a useful little bibliography is appended. The bad housing of the past was due to poverty. Never again, says Dr. Robertson, must the labourer be allowed to suit the house to his wage. Public attention has already been closely focussed upon the evils attendant on bad housing, and it is a relief, therefore, to find that the scope of this book is almost entirely constructive. The minimal standard for a dwelling-house as laid down by the author is certainly not too high, he writes as a practical man rather than as a seer, and in our opinion his plea for the use of electrical labour-saving devices is almost too apologetic.

The welfare both of the expectant mother and of her child depends to a very great extent upon the care devoted to them in the antenatal period, and the first step towards or diminution of the risks incurred by both is, as Dr. Scharlieb says, in the direction of popular education. Dr. Scharlieb has long practised what she preaches, and the gravamen of this book has formed the substance of her writings and lectures for many years. All the popular aspects of pregnancy, with its demands and its dangers, are dealt with in her usual incisive style. She pleads for a larger number of midwives, increased hospital accommodation, and the multiplication of welfare centres, and recommends that facilities be increased for the investigation of the causes leading to antenatal death. A scheme for the endowment of motherhood is also on her list of desirable reforms.

We have said that these books are intended for lay readers, but there is no doubt that they will also prove of interest to many medical men.

Anaphylaxis and Anti-anaphylaxis. By A. BESREDKA. With a preface by E. ROUX. English edition by S. ROODHOUSE GLOYNE, M.D. London: W. Heinemann. 1919. Pp. 143. 6*s.*

IF any reader considers anaphylaxis to be a dull topic he should read this gay account by one who has been in the thick of its experimental investigation almost from the first. And anyone who thinks it a difficult subject may do the same, for the exposition is forcible and for the most part clear enough, the whole finding an admirable summary in the preface by Roux. It is some 17 years since Richet had the idle curiosity to call in the dog Neptune to help with the poisonousness of his extracts of sea-anemones, and—which is the basis of most great discoveries—the wit to see that he had found out something more than that experiments do not always come off. Arthus made further progress, though it was not till Rosenau and Anderson brought "Richet's phenomenon" into the restricted field of pathological vision by using the familiar serum-guinea-pig apparatus that the stream of inquiry fairly began to flow, and finally almost flooded us out. Besredka takes the phenomena seen with egg-white, serum, &c., and the guinea-pig as typical, and describes in order the circumstances of sensitisation by a first injection, of exciting anaphylactic shock by a second injection, of desensitisation by a vaccinating or anti-anaphylactic injection, and finally discusses the theory of the whole business. The view he takes is that now pretty generally admitted: the first injection of a proteid causes the production by the recipient animal of an antibody, which he frankly assumes without clear evidence to be a special "anaphylactic antibody." The second injection, given after an interval in which this "sensibilisin" accumulates, either in large amount, or in curious places, or in both, reacts as any antigen will with its antibody, and, either by the violence of this reaction or on account of the place where it occurs, general symptoms of greater or less severity ensue. These symptoms may be avoided if, quite shortly before the second injection, a *small* dose of the antigen is given, and Besredka points out at some length how easily the anaphylactic troubles of serum therapy may be minimised by his method of small preparatory injections of serum preceding the main therapeutic dose by 10 minutes to 3 or 4 hours, according to the route of administration. The method seems to deserve special consideration now that, e.g., meningitis and pneumonia are being treated with doses of serum undreamed of a few years ago.

With regard to the mechanism of production of anaphylactic shock, the author will have none of Friedberger and the anaphylotoxin he has so profusely propagated. He says, indeed, bluntly that there is no anaphylactic poison; that the union of antigen and antibody results in a harmless complex, and that the disturbance is produced by the antibody becoming attached to, and so enabling the antigen to penetrate, certain nerve cells. Here he is vague. The question at issue seems to be not whether there is a poison or not—unless the cellular injury which objectively occurs is mechanical in origin there must be something somewhere which might be called a poison—but whether the reaction which results in the shock takes place in the fluids of the body or inside the cells. Friedberger would say that the combination of antigen and antibody *in humore* gives a poison, Besredka that it upsets cells because it takes place inside them. The two views are not necessarily mutually exclusive; both parties are, as usual, probably more or less

right, and likely the truth is that the reaction takes place inside cells, and on that account liberates poisonous substances which may act generally as well as locally.

A good many details are naturally, and commendably, left unnoticed; some of the more important recent advances are described in a supplementary chapter by Dr. S. R. Gloyne. The enthusiasm of the narrative leads to a few statements which can hardly be taken at their face value—e.g., that passive anaphylaxis takes place "instantaneously." There is a sad misprint on p. 18, where, at its definition, sensibilisin is called sensibiligen. Neither the title-page nor preface is dated.

Mammalian Physiology: A Course of Practical Exercises. By C. S. SHERRINGTON, M.D., D.Sc., F.R.S., Waynflete Professor of Physiology in the University of Oxford. Oxford: At the Clarendon Press. 1919. Pp. 156.

Professor Sherrington, recognising the fact that a certain broadening of scope of the practical work customary for students in animal physiology is desirable, has in this manual given an admirable response to this desire. The work is correctly described as a course of practical exercises in mammalian physiology, the emphasis being on the word mammalian. In most medical schools what is called "experimental physiology," as carried out by the students themselves, is usually confined to muscle-nerve preparations and the cardiac and spinal physiology of the frog, and but rarely does the student make experiments on a mammal—save on himself. Professor Sherrington does not propose to do away with laboratory experiments on the frog. But he sees that there are other facts of great value and interest, especially to the future practitioner of medicine, which can be better displayed and more easily obtained in the mammalian preparation, and thus, with elaborate detail, describes how in Oxford for some time he has met this proposition. Building on the fact that in a decerebrate or decapitate "carcase"—e.g., rabbit or cat—the circulatory, glandular, muscular, and simpler nervous activities remain for some considerable time, a scheme whereby the student can observe, study, or record, if need be, these activities became possible; but in this course the great fact is that the student does the work himself—it is not a question of a mere demonstration by the teacher—so that by the actual performance of these main experiments he gets a genuine insight into their general significance and into the problems they touch. Moreover, the systematic knowledge acquired from text-books is vivified as well as vitalised, and the interest in their studies intensified and thereby made a living and abiding possession of great practical value where practical work has actually been done.

The course comprises 21 lessons, each consisting of somewhat less than three hours' work. In each lesson certain "observations" have to be made, and full details for these are given, the instruction being greatly aided by anatomical and other notes set forth in nine plates in colour admirably drawn by the author himself, diagrams of apparatus, and graphic records in the text, reproduced from the tracings obtained by the class students themselves. To each exercise is subjoined a short annotation concerning the source and bearings of some of the more salient observations included in the exercise. Their trend is often historical, and many references are given to publications in which additional details are to be found. By way of showing how all these observations can be carried out on the "carcase," and how they can be so arranged as to obtain the maximum profit from each animal utilised, an appendix is added at the end of the volume. There is an index of the names of authors referred to in the text, but with rare modesty the author omits his own name, though there is scarcely an exercise to which he himself has not made some original contribution.

Ninety-five "observations" are comprised in the 21 "exercises." The idea of the extraordinary scope of the work done in about 60 hours can be best grasped by a limited epitome of the main experiments. Given a "decerebrate" or "decapitate" carcass of rabbit or cat—no dogs are used—the first exercise comprises the study and recording of intestinal movement and tone, with the action of adrenal extract on these and on the excised spleen and arterial wall. The circulation next is taken in hand, comprising revival of the excised heart by coronary perfusion; the influence of temperature, adrenalin, and chloroform on the excised heart; inspection of the lungs, great vessels, and the heart beating in situ; vagus inhibition, and effect of raising the intra-pericardial pressure. Then follow graphic records of arterial pressure by the kymograph, and the effect on heart and blood pressure of stimulation of the vagus and spinal cord and splanchnic nerve; "vagus escape"; the action of atropine, adrenalin, amyl nitrite, pituitary extract; asphyxia; artificial aortic stenosis and insufficiency; time of the lesser circulation, action of the accelerans on heart rate, and other cardiac phenomena. Renal secretion, hydræmic plethora, diuresis by caffeine citrate, effect of pituitary extract, perfusion of the kidney with normal saline, and the action of adrenal extract and amyl nitrite with cognate subjects occupy two exercises. Next salivary secretion—corda stimulation—and the action of pilocarpine and atropine are studied. Then follow observations on respiratory movement and allied phenomena; respiratory rhythm and the effect of nerves thereon; air-embolism, pneumothorax, respiratory undulations of blood pressure, and the various reflexes connected with the glottis, and swallowing in its various aspects.

Pressor and depressor phenomena are then dealt with, and so are other reflexes. This leads up to knee-jerk functions of the spinal roots and other spinal phenomena, cervical sympathetic action, proprioceptive reflexes, measurements of reflex and twitch, postural tone, and reflex inhibition of posture and contracture. Hæmorrhage and arterial pressure and restoration of the latter by gum-saline injection, clotting, and fibrinogen are all described. One exercise is given to "washed leucocytes," phagocytosis, and opsonic power of serum, and another to preparation of secretin, pancreatic secretion, and bladder-bile. Fortunate indeed are the students who obtain such a compendious, practical, and vivifying course of instruction in applied physiology. We most cordially endorse the view of Sir George Newman that these exercises are an illustration of the kind of applied physiology which should be taught in all schools of physiology.

As was to be expected, Professor Sherrington has done his work with a master hand. If we compare the operative training and the vast amount of knowledge directly and personally acquired during 60 or 70 hours spent in a well-equipped physiological laboratory with the modicum of anatomical detail acquired during the same time in the dissecting room, there seems to us to be no doubt as to where and how the medical student can most profitably spend what after all represents less than three full days of his academic time.

Modern Medicine and Some Modern Remedies: Practical Notes for the General Practitioner. By THOMAS BODLEY SCOTT, M.R.C.S. Eng., L.R.C.P. Edin. Second edition. London: H. K. Lewis and Co., Ltd. 1919. Pp. xvi. + 198. 6*s.* 6*d.*

THESE essays were first reviewed in our columns in September, 1916. It is no surprise to us that a second edition should have been called for. Dr. Scott writes in a style that is at once pleasant to read and that carries with it the confidence of the reader, who feels instinctively that the author has used his observation not only at the bedside but also in the laboratory, and that he has used it with a shrewd discrimination. In dealing with such ailments as heart disease and chronic bronchitis the general practitioner learns much that was never taught to him as a medical student, and many who are setting up in practice at the present time will be the wiser by borrowing from Dr. Scott's well-stocked store of common-sense.

JOURNALS.

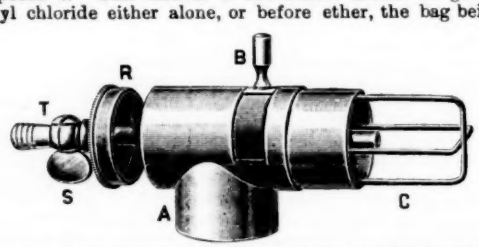
Quarterly Journal of Experimental Physiology. Editors: E. SHARPEY-SCHAFER, W. D. HALLIBURTON, C. S. SHERRINGTON, E. H. STARLING, A. D. WALLER. Vol. XII., No. 2. London: Charles Griffin and Co. 1919. Pp. 97-198. 7*s.* 6*d.*—Carbohydrate Metabolism in Relation to the Thyroid Gland (IV.): The Effect of Thyroid Feeding on the Gaseous Metabolism of Thyroidectomised Rats, by W. Cramer and R. McCall. Such animals react to thyroid feeding by an increased metabolism, but this experimental hypothyroidism shows two stages. In the early stage in which the metabolism is reduced if thyroid gland is administered the metabolism is brought back to that of the normal animal; in this respect it is similar to pathological hypothyroidism. In the later stage the metabolism is similar to that produced in a normal animal by thyroid feeding. This result seems to be due to a compensatory mechanism, and does not really represent a condition of true hypo-

thyroidism. The increased metabolism due to thyroid feeding occurs also in the absence of preformed carbohydrate in the food. It appears that all changes in metabolism can be explained as being the result of disturbance of the glycogenic function. It is suggested that in Graves's disease a diet rich in carbohydrates is indicated to counteract the loss of flesh which is one of the features of the disease.—The Action of the Blood-serum of the Dog in a Condition of Tetania Parathyreopriva on Voluntary Muscular Tissue compared with that of Normal Serum, by B. A. Houssay. Neither of these serums causes tremors in the muscles of the South American frog (*Leptodactylus ocellatus*). Five out of six samples of tetania serum produced tremors in the muscles of a toad (*Bufo marinus*), while four samples from normal dogs produced tremors. On the other hand, four other samples from normal dogs produced no effect.—The Adrenalin Content of the Suprarenals of the Female White Rat and the Changes Brought about by Thyroid Feeding and other Conditions, by P. T. Herring. The suprarenals of young female white rats are normally 40 per cent. heavier than the suprarenals of the male animals of the same weight, while the adrenalin content of the suprarenals of the female is twice as large as that in the male of the same size—e.g., average adrenalin in female 0·073 mg., in male 0·034 mg. These differences are associated with sex differences in the other endocrine glands and organs of the body. The adrenalin content is increased during pregnancy, but is not permanently altered by the occurrence of this condition. The female white rat is less tolerant of thyroid feeding than the male; a daily dose of 0·2 g. fresh thyroid if continued is too high and checks the rate of growth of the animal. Thyroid feeding causes a rapid increase in the weight of the suprarenals, but more so in the male. The chromaphil tissue of the female rat normally contains a much higher level of adrenalin production than it does in the male. The increased size of the suprarenals following on thyroid feeding is mainly due to hypertrophy of the cortex. The percentage amount of adrenalin is always diminished by thyroid feeding.—The Effect of Phloridzin on the Permeability to Glucose of the Frog's Glomerular Membrane, by R. Brinkman. The surviving kidneys of the frog were perfused with certain solutions of known composition—e.g., Ringer's fluid—and the result showed that frog's glomerular membrane is, under normal conditions, impermeable to physiological quantities of glucose. The "urine" obtained was compared with the fluid perfused. The rate of diuresis had no influence on the results. So far as glucose was concerned—the urine obtained always contained the percentages of glucose (0·05-0·1 per cent.) in the perfusing liquid. Further experiments showed that the permeability of the glomerular membrane is dependent on the composition of the perfusing fluid—the concentration of the free Ca-ions is the factor of greatest importance in this connexion. If the Ca-ions have a certain concentration the membrane shows itself impermeable to physiological quantities (0·06 per cent.) of glucose. If the concentration exceeded 0·003 per cent. $CaCl_2$ the membrane became permeable to glucose. A second factor is the preservation of the normal slight alkaline reaction of the perfusing liquid (= 0·285 per cent. $NaHCO_3$) = to that of frog's serum. As to the action of phloridzin, it is known that phloridzin-glycosuria is a renal process, most investigations finding that blood-sugar is not increased, it may even be decreased—i.e., hypoglycæmia. Many suppose that this drug causes the tubuli to secrete glucose. It was found that the addition of 0·0004 per cent. of phloridzin to the solution already described is sufficient to make the otherwise impermeable membrane wholly permeable to physiological quantities of glucose, though the membrane is not influenced by many other drugs—e.g., atropin, pilocarpin, nicotin, narcotics. The concentrations of the glucose in the urine closely follow those in the corresponding serums. Phloridzinised frogs show well-marked hyperglycæmia. Phloridzin promptly makes the glomerular membrane permeable to glucose. In higher animals secretion of glucose by the tubuli is the dominating phenomenon. — A Convenient Method of Recording Pulmonary Blood Pressure, by Sir Edward Sharpey Schafer. The method was used in some of the experiments described in the Effects of Adrenalin on the Pulmonary Circulation, by Sir Edward Sharpey Schafer and R. K. S. Lim. The intravascular administration may produce effects on the pulmonary circulation by (1) an effect on the pulmonary arterioles, causing constriction, or in some cases dilatation of these vessels, resulting in a diminution or increase of the flow and a rise or fall of the pressure in the pulmonary system; (2) on the musculature of the heart through the sympathetic nerve and coronary vessels; (3) on the conducting (Purkinje) fibres under the endocardium; and (4) indirectly as a consequence of constriction of the systemic arterioles and great rise of the aortic pressure. The effects produced upon the aortic system can be similarly caused in four ways. First the effects of perfusing adrenalin through the surviving lung were studied The results of previous observers are not in accord. In the rabbit adrenalin in moderate doses injected into the jugular vein usually at first causes a rise of pulmonary blood pressure, owing to constriction of the pulmonary arterioles, or shows no effect on this system. If there is great constriction any rise in the pulmonary system is soon converted into a fall, gradual recovery following as the constriction passes off. The effects are similar when it is injected into the aorta through the carotid, but the preliminary rise is absent. In the cat the usual result is a sharp, well-marked rise in both pulmonary and aortic pressures—and usually with parallelism in both systems—which must be of cardiac origin. In the dog there is a great rise in both systems, sometimes running almost parallel. The rise in the pulmonary system is not due to "back action" propagated from the aortic system. There may be no rise at all in the pulmonary, with great rise in the aortic systems, even when the aortic pressure is raised by compression of the aorta and in other ways. In rabbits the chief effects of adrenalin upon both pulmonary and aortic pressures are produced upon the blood-vessels, but in most cats and dogs the chief effects are produced by the drug upon the cardiac musculature. The musculature of the two sides of the heart may be differently affected by adrenalin, which may be due to its action on the Purkinje network of the ventricles.—The Effect of Adrenalin on Muscular Fatigue in *Leptodactylus ocellatus* and in *Bufo marinus*. By John Guglielmetti. Subcutaneous or intravenous injection or perfusion produces recovery of muscular contractions which have been abolished by previous fatigue. Given sufficient doses recovery may be obtained in muscles which have been wholly exhausted. Recovery is more usually obtained when the adrenalin is made to act early upon the preparation.—Note on Strychnine Tetanus. By Arthur R. Cushny. The author's experiments lead him to conclude that it is unnecessary to assume, as as been done, that strychnine changes the ordinary coördinated reflex, not only in quantity, but also qualitatively, by inducing a reversal of inhibition into contraction. Strychnine tetanus is merely a quantitative change of the "start" reflex which occurs under normal conditions.

New Inventions.

A VENTILATING ETHER BAG MOUNT.

THE accompanying illustration shows a bag mount designed to afford an inhalation as "open" or "closed," as the administrator may wish. A fits Hewitt's wide-bore inhaler and face-piece. An Ormsby (or paper) bag is attached over the cage C by a thick rubber band. B opens a window, simultaneously cutting out the bag to any desired extent. T admits gas, oxygen, or ethyl chloride to the bag, whatever the position of B, and is removable for cleansing purposes. R, fixed to T, is pushed home into A for use. Gases can be retained in the bag by opening B and closing T by the stopcock S. This affords a convenient means of giving ethyl chloride either alone, or before ether, the bag being



charged before applying the face-piece and gradually opened as the window at B is being closed. For the gas-ether sequence a little hot water can be poured into the Ormsby through A. With less than two ounces of ether anæsthesia can then be induced in about three minutes, usually without appreciable coughing or struggling. During the operation B is always more or less open, so that with every breath the patient gets some fresh air, as warm and moist as the anæsthetist may desire. The hot water in the bag can be easily renewed or the bag may float in a bowl of hot water. The mount (and bag) can be boiled, there are no valves to get out of order. By means of an "adapter" the mount may be adjusted to an ordinary "Clover" or face-piece. I have used this apparatus for brain cases and abdominal operations of every kind during the last five years. It is made by Messrs. Barth.

BERESFORD KINGSFORD, M.D. Durh.,
Anæsthetist, University College Hospital, &c.

THE LANCET.

LONDON: SATURDAY, AUGUST 2, 1919.

Science and Unrest.

TRULY these are progressive times, when we find labour organisations demanding State aid for scientific research on the ground that the value of scientific advancement to the welfare of the nation is many times greater than the cost of the necessary laboratory quest. Public recognition of this fact will mean the era of a great movement of the utmost social and economical importance. When it is realised that increased productivity of industry results from scientific research, a powerful aid will appear to those involved in an ever increasing struggle to raise their standard of living. In applied science there lies a possible solution of many disastrous labour problems, and none too soon those who labour are perceiving it. Have they not seen the truth before their organisers or their employers?

In a remarkable manifesto on scientific research recently drawn up by the American Federation of Labour it is maintained that the importance of scientific applications in industry must steadily increase, since there is a limit beyond which the average standard of living of the whole population cannot progress by the usual methods of readjustment, a limit which can only be raised, it is claimed, by research in industry. The wise solution of the numerous important and pressing problems of administration and regulation now facing almost all Governments of the world depends, it is suggested, upon scientific and technical research. It would be a remarkable consummation in the history of the world, as is here hinted, should science ultimately prove to be the palliative of unrest. And it seems probable, if we accept the application of science to mean increased production and output of what is essential to the existence and welfare of both workers and community. This may be a truism and altruism well worth the serious thought of our counsellors. The community has its claims on medical science also for maintaining the health and well-being not only of the workers but of the whole population, which is thus dependent upon scientific advances in medicine and sanitation. Without research progressive medicine is, of course, impossible, and medical science could not have reached its advanced stages without intensive studies along all sorts of ancillary lines; and similarly progressive industry and output must be dependent upon deeply searching and minutely inquisitorial work. The war has brought home to us the fact that the world has ignored a great asset brought into valuation by the pursuit of knowledge; the war was largely won by applied science, and it is to science properly applied that the world looks for regeneration. The British Labour Party has recognised this, and its advisory committee on public health has urged on the Ministry of Health as one of its main duties the direct prosecution of medical research and its encouragement in universities and elsewhere.

Here is a concrete example to which we referred last week—namely, the encouragement of research work in drugs by the State, which resulted in great advantages to the country. At the outbreak of the war there was a threatened famine in essential drugs, the supply and preparation of which had hitherto been left entirely to enemy sources. The National Health Insurance Commission were fully alive to this fact and to the possibility of disaster looming ahead on this account; but with the assistance of the Royal Society and various State departments scientific workers and manufacturers were brought into touch with each other. The result was that there was no drug famine, no really important medicine was lacking for essential purposes, and at no time did the public health suffer from a lack of medical and surgical material. What was done by the State in encouragement of one particular and important industry in a time of emergency should obviously be continued with benefit to all the economic and industrial resources of the country now that the war is over.

Psychiatric Clinics.

THE essential mystery of mental disease baffles us now as it did a century ago, and Dr. BEDFORD PIERCE, in his presidential address to the summer meeting of the Medico-Psychological Association, queries whether the recovery rate has increased during that time. But signs are not wanting of encouragement. During the past year several medico-psychologists have been earnestly engaged in framing recommendations for the more rational treatment of patients suffering from incipient mental disease. It is satisfactory to note that the result of their labours is likely to bear fruit in the near future. The experience gained in the special hospitals for similar cases under military organisation has served to bring to a focus what has long been held to be desirable in civilian practice. But to attain this objective no proper provision exists, as is well known, neither is there legal sanction. The prevention of disease is as much the rôle of the practitioner as is the cure and care of patients. To this end the sooner a case of threatening mental breakdown can be dealt with the better should be the result secured; and it is not too much to hope that insanity may yet be nipped in the bud to no small extent. The extension of the voluntary boarder principle to the county and borough asylums, which is being promoted, is a step in the right direction, but there is a large class for which other facilities for early treatment must be devised. The establishment of recognised homes for incipient or border-line cases, advocated by Dr. L. A. WEATHERLY last week, is, we think, generally approved, subject to notification to some public authority competent to exercise supervision. Such homes would apply to private patients in a position to defray the expenses incurred. But for the person of slender means the demand for psychiatric clinics seems to be imperative in order to keep abreast of the times.

Several of the voluntary hospitals, in response to appeals, have instituted out-patient clinics for mental cases, but apparently they hesitate to allocate beds for them. No doubt this would entail the building of an annexe, or, at any rate, the provision of a special ward with suitable arrangements, and the services of nurses with asylum training. It is quite possible that the overcrowded state of the hospitals militates against a departure which involves increased responsibilities and expense. Yet the advantages which should accrue are manifest

in bringing mental diseases into closer alliance with other diseases, and the consultations between the various departments would be of the utmost value. Moreover, the class-rooms and laboratories would be at hand, and there would be increased opportunities for the scientific teaching of psychological medicine. The finances of such a scheme for mental clinics might very fairly be met by contributions from the local authority or central exchequer, and this, we take it, is provided for in the legislation proposed by the Board of Control. The union infirmaries, to which the poorer classes of mentally affected patients in the first instance have access on certain conditions, can scarcely be held efficient under the present regime. The medical and surgical staffs are inadequate, there is a need for workers in pathology, and their status would be improved by the appointment of a recognised authority on psychiatry to direct the treatment of mental cases. In the interests of public health mental patients should be able to obtain early treatment without the formalities of the three-day order and certification, which, with the added stigma of pauperism, have such a baneful influence on persons in the incipient stage of insanity. Reform can only be achieved by dissociating the management entirely from the Poor-law in name as well as in fact. Were this accomplished, it is more than probable that many existing buildings could be remodelled and adapted for the formation of psychiatric clinics, in addition to those which the voluntary hospitals may in time provide, and where medical schools exist in the vicinity they should be affiliated to the clinics for the purposes of teaching and research.

But besides these problematical innovations there is yet another method to deal with the situation, which has already been initiated, and that is to build hospitals for incipient nervous and mental diseases analogous to the special hospitals that exist for other diseases. There is much to be said for this movement, and it might save the cost of the continual additions to the asylums of the country. These hospitals should constitute thoroughly up-to-date psychiatric clinics with every means for scientific investigation; care should be taken that they are bereft of any tinge of asylum atmosphere, or they might defeat the object in view. The Maudsley Hospital, which is equipped with modern laboratories, already exists owing to the foresight of its munificent donor, and it is to be hoped that no time will be lost in admitting suitable patients on a voluntary basis when the military authorities have evacuated it. The meetings of delegates of the various asylums' committees of the country which took place at the Guildhall this year on the problem at issue have resulted in good work, and we observe with satisfaction that it is proposed to institute a psychiatric clinic at Cardiff, to which allusion is made in our news columns. By such means we may, as Dr. EDWIN GOODALL suggests in his letter, remove the reproach at present resting on psychiatry in this country. For the moment, however, there is this difficulty to be faced. The functions of these clinics, and more especially of approved homes, can scarcely be performed without risk in the present state of the lunacy laws. These and other cognate matters have received the careful attention of the Board of Control, whose recommendations are in close accord with those contained in the report of the Lunacy Legislation Committee of the Medico-Psychological Association. An amending Bill drafted by the Board of Control has been, we understand, in the hands of the Government for some time, and it is regrettable that this measure has not been brought forward this session in connexion with the Ministry of Health. The position of the various administrative departments of health will require rearrangement under the new Ministry, and it would seem feasible for lunacy to come within its province, a course rendered possible by an Order in Council. The transfer, if effected, should not interfere with the duties of the Board of Control, whose work in administering the present Acts is fully appreciated, and we are glad to find that the Board is in sympathy with the new aspirations for more rational means of treating the early stages of mental disease.

Medical Trade-Unionism.

THE Annual Representative Meeting of the British Medical Association was held last week under the presidency of Dr. T. W. H. GARSTANG, the Chairman of the Representatives, and, as might have been expected, having consideration to the times in which we live, the trade-union question in reference to the medical profession was treated as an important issue. A recommendation was received from a large provincial branch that the British Medical Association should not endeavour to prevent its members from joining any other organisation which was attempting to combine the profession on trade-union lines, the reference clearly being to the Medico-Political Union, a body which is frankly committed to trade-union principles. Speeches were made by some who had already given in their adherence to the Medico-Political Union, and although their arguments were not perhaps conclusively dealt with, the vote showed that the British Medical Association, through its Representatives, disagrees in great majority with any attempt to convert the profession of medicine into a trade-union. It is no reproach to clear thinking, or to the debating powers of either side in the controversy, that nothing was said proving the one side to be wholly right or the other side to be wholly wrong; the arguments for the introduction into medical practice of trade-union principles are very strong, but the arguments which can be employed in opposition are at least equally strong; and it is a great error on the part of those who see salvation in the formation of a trade-union to insist that those who dissent from them are influenced only by motives of obsolete snobbery.

That a trade-union may be an effective weapon capable of good use and capable of gross abuse we all know at the present day, but its virtues and its defaults have been displayed in association with callings which cannot be compared with the calling of medicine. The analogies usually employed in this controversy are imperfect. A trade-union must be substantially a union of those employed in the trade, though no doubt every trade-union has among its supporters dissentients who now and again form a considerable body of opinion. None the less, the members have a common policy, and by effective weapons which are within their reach can stimulate political activity along the desired lines. The medical profession cannot have a common policy, except in the carrying out of the grand ideal to serve humanity. Certainly in the pursuit of this ideal medical practitioners have the right to formulate a common demand for proper remuneration, and this demand depends for its real force upon no vaporous or sentimental claim to the

gratitude of the public, but upon the undeniable argument that good service can only be rendered by men who are placed in a proper position to do good work. Where that work is multifarious it is exceedingly difficult to devise a plan to insure that along each and all the lines justice is being done. Clearly no single rate of wages, with which a trade-union is so well able to deal, would meet the case. It is generally admitted that the most ardent advocates of medical trade-unionism have no intention of using the last weapon of the trade-union—namely, the strike; but a proposal to substitute for the strike against individuals a strike against Government regulations may be a distinction without a difference. A recent memorandum by the Medico-Political Union states that panel practitioners are the only citizens in this country who are, at the present time, outside the protection of the law, the statement deliberately excluding the position of the Civil Servant. It is conceivable, and indeed conceded, that a large body of the medical profession, being engaged in homogeneous work by a common employer, form typical material for a trade-union, and in this sense is doubtless to be construed the National Insurance Defence Trust to be administered by the British Medical Association. But what is to be the attitude of other members of the medical profession not in the same position? They cannot be forced into a trade-union, and their scientific and humanitarian services must be available for the benefit of medicine as a whole, within and without its sections.

It was to assist in the solution of such questions that the Medical Parliamentary Committee was formed, and if in its present shape as a British Federation of Medical and Allied Societies it should become representative, the medical man through any body, association, or group with which he is affiliated, would give a vote on these great questions and inaugurate a policy of strength and of conciliation. But it is understood that the British Medical Association, within whose ranks a difference of opinion on the trade-union question has become manifest, will not revise its opinion that this Federation has no reason for its existence. The British Medical Association is the elaborate work of men devoted to the interests of the medical profession, and every respect must be paid to their decision; but here is a question of vital importance upon which apparently members of the Association do not think alike. If the trusted leaders of the Association would debate this and cognate questions with a real federation of medical and allied bodies good would emerge.

THE Government's intention to regulate the sale of products which in the past were limited by patent was made by Sir Auckland Geddes, President of the Board of Trade, in the House of Commons on July 28th, on the occasion of his moving the second reading of the Trades Marks Bill. In what he said he was guided probably by the recommendations of the Select Committee on Patent Medicines, the report of which was ordered by the House of Commons to be printed August 4th, 1914. This Committee proposed that fancy names for recognised drugs should be subject to regulation, and that the period of validity of a name used as a trade mark for a drug should be limited, as is already the case with patents and copyrights. We anticipate that legislation will follow in this direction.

Annotations.

"Ne quid nimis."

THE FUTURE OF HOSPITALS IN IRELAND.

AN Irish correspondent writes: "There is no more urgent medical question in Ireland at present than the future of the voluntary hospitals. In Dublin, the Richmond, the Whitworth, and the Hardwicke Hospitals are controlled by a common board of governors, and since 1856 have enjoyed a Government subsidy of £7600 per annum. They have no other funds, and as the cost of maintenance has risen from a pre-war figure of £64 per bed to a present sum of £119 per bed, they are in serious plight. All the governors have tendered their resignation to the Lord-Lieutenant, the hospitals being now without funds to pay tradesmen's bills. The Whitworth Hospital is definitely closed. For some time the Treasury grant has been held by the bank and devoted to the reduction of the overdraft. The Irish Government has now expressed its inability to come to the relief of the hospitals in their present crisis, and if this course is persisted in the only chance is for the Dublin Corporation to act, but the rates are so terribly high in that city that little hope is felt in such a relief. In Belfast—with a population much larger than Dublin—the Government has never contributed a halfpenny to the hospitals, but it is plain that hospitals there cannot go on unless the working-classes themselves—with their present high wages—give more to the places to which their debt is so huge. At the Royal Victoria Hospital an arrangement is in force by which, for a penny a week contribution, a working man and his wife and family are treated at the hospital—as extern or intern patients—except for the zymotic fevers and tuberculosis. This plan, which was made about a quarter of a century ago, is utterly out of date now, and the contribution should be raised to at least sixpence weekly or even more. Middle-class people who formerly subscribed to the hospitals can do so no longer, as owing to the diminished purchasing value of the sovereign and the heavy taxation they are greatly crippled financially."

THE COMMOTIONAL FACTOR IN THE ÆTIOLOGY OF SHELL SHOCK.

IN our present issue Dr. Alfred Carver records in some detail a series of experiments on animals which has a direct bearing on the problem of the ætiology and symptomatology of so-called shell shock. Dr. Carver describes in a lucid way the three zones produced round a point of detonation, and brings forward evidence to show the different physical effects in these three zones. In the first, the zone of "brisance," objects are shattered by the sudden terrific compression; in the second, the zone of "decompression," there is very much less evidence of actual destruction or distortion of objects; in the third, outer zone, physical effects are modified still further. Some significance is attached to the fact that in the central zone other high explosives will, under the influence of the original detonation, themselves spontaneously detonate, as will, in the intermediate zone, those whose tonal standard is somewhat similar to that of the primary explosive. Corresponding to these physical changes are the effects produced on

animals finding themselves within the various zones; thus in the innermost zone animal life is destroyed, with laceration of the body structures; in the intermediate animals are rendered unconscious, often with no sign of external injury; in the outer a state of diminished activity is followed by a period of excitement and restlessness. Pathological evidence reveals numerous hæmorrhages in the zone A animals, and capillary engorgement in such zone B animals as are killed. There is, perhaps, something of the artificial and the schematic in these experiments, and some psychologists may be inclined to minimise their importance, as regards human beings, in judging of the effects of shell concussion not merely in the physical atmosphere but also in the mental. Dr. Carver's experiments, however, are supplemented by valuable observations on the effect of high-explosive detonations on a more or less picked set of men belonging to an "ammunition proof and demolition section," according to which definite physical and mental symptoms supervene on shell explosions even where the "psychic factor" can almost certainly be eliminated. Again, evidence is adduced of the peculiarly "demoralising" effect of shells with fillings layered in a special fashion, as though an unusual physical effect is somehow transformed into an unusual psychical disturbance. We feel that Dr. Carver is justified in his contention that both physical and psychical factors operate in the production of shell shock, and that differentiation of their respective actions is a matter of considerable difficulty. In any case, to ignore the physical element is unwise, and to restrict psychical phenomena to a psychical ætiology is unscientific. Our experience of shell-shock cases over the five years of war is in the main that the physical factor predominates in the originating of shell shock; that thereafter subconscious or unconscious "rumination" takes its place in the continuing of the symptoms; that the first two years saw more severe and protracted and inveterate cases of the condition than the last two—a fact which may be taken to suggest that in the perpetuation of symptoms the psychogenic element is much the more important. The *commotionné* becomes an *emotionné* in many instances; clear-cut examples of the two syndromes, we agree with Dr. Carver, are the exception and not the rule.

IMPERIAL CANCER RESEARCH FUND.

THE seventeenth annual report of this Fund, dealing with the year 1918–19, has just been issued, and consists of statements by the secretary, the director, and the honorary treasurer, together with a list of the year's subscriptions (£956 0*s.* 4*d.*, making with amounts acknowledged in previous years £174,112 2*s.* 5*d.*), and a statement of accounts. Mr. F. G. Hallett, the secretary, points out that now it is becoming possible to resume systematic investigations in the laboratories the foresight shown by expending time and labour in maintaining the various tumour strains in mice is justified, for already material for research purposes has been supplied to Professor Borrel's Laboratory and the Institut Pasteur, Paris, and to Dr. J. Shaw Mackenzie at King's College. The report of the director, Dr. J. A. Murray, shows that during the war, while the working organisation has been maintained, the main efforts of the staff have been concentrated on war problems, the results of which work will shortly be published in the Sixth Scientific Report. This, for the most part, will deal with the investigations of Messrs. W. E. Bullock and W. Cramer on new factors in bacterial infections, and by Dr. Murray on cellular changes on cartilage grafts. The report of Sir W. Watson Cheyne, the honorary treasurer, records the gratifying fact that the loan from the bankers has been reduced by £1700, leaving only £500 still to be cleared off. As the scientific staff, depleted owing to the war, is now nearly at full strength, researches will be energetically resumed with a necessarily increased expenditure, and an earnest appeal is made to all who are interested in cancer research to support the Fund themselves and to induce others to do likewise. "Looking to the heavy death-rate from malignant disease," says Sir Watson Cheyne, "it must surely be to the interest of the community that this Fund should not be starved in its efforts."

TRAUMATIC PSORIASIS.

FROM a recent article on this subject by Döllner,[1] of Duisburg, it appears that Köbner in 1872 was the first to describe this form of the disease. Another case was published in the *Lyon Médical* in 1895, in which psoriasis followed vaccination in a man, aged 22, who was alcoholic himself and belonged to an alcoholic family. Otherwise, apart from a case published by Becker in 1906, Döllner has not been able to find any example of traumatic psoriasis on record. He has lately observed two examples himself in soldiers who developed psoriasis after gunshot wounds, in one case of the tibia and fibula, where the psoriasis appeared on the injured leg but not at the site of the wound, and in the other at the actual site of the wound in the tibia. The last case was, further, of interest in that it proved to be infectious. Six months after his discharge from hospital the patient's wife, who had recently recovered from scarlet fever and still had a trace of albumin in the urine, developed psoriasis, which extended over both knees and the middle line of the back. In another two months her mother also contracted psoriasis. In a postscript Döllner relates the case of a stretcher-bearer who was wounded while carrying another wounded man, the subject of psoriasis, and developed the skin disease a fortnight later on his face, knees, and back.

THE PLIGHT OF VIENNA HOSPITALS.

THE prestige of the Vienna Medical School has for long been high in this country as anyone may see for himself by turning over the pages of the Medical Directory and noting the names of distinguished British surgeons and specialists who took post-graduate study there. The number of its students was never greater than was the case in 1914 on the eve of the war. The contrast between its situation then and the situation of the school to-day is startling and tragic. The hospitals, at first overwhelmed with wounded men and later with the victims of epidemic disease, are now filled with enfeebled and semi-starved patients, while lacking the food and equipment necessary to minister to their needs. Tuberculosis has developed into a deadly and acute disease. Nephritis has taken vast toll. Continuous underfeeding with its results seen as hunger-dropsy, rickets, scurvy, and Barlow's disease, provide the major part of the clinical material. In one clinic alone there were recently to be seen 18 cases of spontaneous fracture

[1] Arzt. Sachverst. Ztg., 1919, xxv., 64–5.

in adults due to inanition. In consultation with Professor Tandler, Austrian Minister of Health, an effective organisation for the distribution of relief to the hospitals and kindred institutions has been brought into being. This is known as the International Spitalhilfsaktion, which has its offices at the Albrecht Palace, and its own private store houses. It is independent of other Government departments and is controlled by an international committee, of which Professor Wenckebach is chairman. An appeal to provide the urgent means of relief for this excellent organisation to distribute has been issued by Frau Dr. Biene, Frau Hofrath Lecher, Mr. C. K. Butler, chief of the British Mission, Mr. Halstead, chief of the American Mission, Mr. Karpeles, of Schenker and Co., and Dr. Hector Munro representing the Save the Children Fund. The most urgent need exists for extra rations to give to these hospital patients. The foodstuffs required are enumerated as fats (margarine, butter, cod-liver oil), sugar, eggs, meats, milk, and flour—the list suggesting, what we believe to be the fact, that the present diet of hospital inmates consists principally of broth and tea. 46,000 gallons of milk (of which 11,000 turned sour owing to difficulty of transport) are stated to have been the total supply for a population of over two millions during three recent days. Those to whom Vienna is a pleasant memory of student days will interest themselves in bringing the needs home to those who can supply them. The address of the Save the Children Fund is 329, High Holborn, London, W.C. 1.

TRAUMATIC ANEURYSM OF THE RIGHT VENTRICLE.

SPONTANEOUS aneurysm of the heart is rare enough; Dr. Claude Wilson, in recounting an interesting case, indicates how easily the condition may be overlooked. Traumatic cardiac aneurysm is rarer still, although less likely to elude diagnosis during life. In the *Journal of the American Medical Association* of June 7th Dr. G. H. Curfman and Dr. C. R. Fuller have recorded a case. On July 19th, 1917, a youth, aged 18 years, complained of the effects of a kick in the epigastrium by a mule. Since the injury he noticed difficulty in breathing, which steadily increased. There was persistent cough, accompanied by expectoration, the sputum consisting of frothy mucus tinged with bright blood. During the previous month the abdomen, ankles, and legs had become greatly enlarged. On examination the face was swollen, with marked puffiness under the eyes. The lips and tongue were very cyanotic. There was pronounced pulsation of the jugular veins. On lying down the whole face became extremely cyanotic. The cardiac impulse was heaving and could be seen to extend from the seventh interspace, about 1½ in. to the left of the middle line over the entire cardiac area. Cardiac dullness was greatly increased both to the right of the sternum and to the left of the mid-clavicular line. There was a loud systolic murmur most audible at the apex and transmitted over the whole cardiac area. At the end of systole the murmur became "whistling" and then faded into a faint blowing sound. The second pulmonic sound was accentuated. The abdomen was distended with fluid and there was marked tenderness, most noticeable in the epigastrium. The liver extended three fingers-breadth below the ribs and was tender on pressure. The lower limbs, from the ankles to above the knees, were swollen and œdematous. He gradually became worse; the cyanosis deepened and the abdomen became more distended with fluid. The pulse became weak and irregular. On Feb. 27th, 1918, he passed into mumbling delirium and died. The necropsy revealed a greatly thickened pericardium containing about a litre of light amber-coloured fluid. The heart was enlarged and weighed 723 g. At the apex of the right ventricle was an irregular tumour about the size of half a lemon, which proved to be a sacculated aneurysm connected with the ventricle by an opening which admitted the index finger. The right ventricle was greatly hypertrophied and there was relative insufficiency of the tricuspid valve. The abdomen was normal except for a large amount of ascitic fluid.

THE HANDICAP OF DISABLEMENT.

THE Central Hall, Westminster, on July 24th was crowded from floor to ceiling with men who had lost their limbs in the Great War. The sight while the hall was being filled was one which at first could only engender feelings of despair, some of the men being so helpless that they had to be carried, others legless, shuffling along the floor by the aid of their arms only; but before the end of the meeting that feeling gave way to conviction that the awful pageant presented by the tragedy of war had its hopeful side. Under the auspices of the London War Pensions Committee and the British Red Cross Society the meeting was convened with the object of demonstrating to disabled soldiers and sailors the possibilities of success in life which lay before them, and with this purpose in view two American gentlemen, Judge Corley and Mr. Michael Dowling, who had been crippled in youth, but in spite of their disabilities had risen to positions of honour and trust, practically by their own efforts, gave their experiences. Sir Laming Worthington-Evans, Minister of Pensions, who presided, in introducing the speakers, said—and the attitude of the meeting proved his words—that if one really wanted to get among people who were stout-hearted and cheerful it was necessary to go among limbless men. He desired to see these men put in the service of the country, and into as good a position as possible by providing them with artificial limbs, but the coöperation of the men themselves was also necessary. Each man's case was a separate case, and after the skill of the surgeon, who was doing his very best, had been requisitioned, there was need for the individual who used the artificial limbs to select and learn to use properly the instrument which was best adapted to his purpose. Judge Corley, who had no arms, then gave a demonstration of the instrument which he had invented and perfected, and which enabled him to perform all the necessary actions of daily life. The main principle of the apparatus was that of the working of a pair of forceps, with various attachments for eating, drinking, performing the daily toilet, and even paring the toe-nails. As he explained, he could drive a motor-car, shave, play games—in fact, enter into life with the same enjoyment as a man with both his hands and feet. "And I get my full share of that enjoyment," he exclaimed with conviction. Warning his hearers against the danger of allowing the natural sympathy of the public towards them to lead to apathy, he concluded by exhorting the disabled to endeavour to do for themselves everything it was possible to do. Prince Albert, who was present, in the course of a short speech said: "We all know what you did in the war and what you have suffered, and it is now up to us to make

things as easy for you as possible. And only right that we should." The Prince then made an inspection of the exhibits of the work done by limbless men at the various training centres, which included many of the arts and trades of the country. After a cinematograph display showing Mr. Dowling as an expert motorist, the subject of the pictures himself gave a stirring address, the keynote of which was "grit." The knowing man, he said, did not pick out the winner by listening to the tales of tipsters or stableboys, but by noting the handicap and record of the horse. The greater the handicap the more certain it was that the horse had got the stuff in him if he won the race. And the man who had lost a limb in the war was likely to have the stuff to win. Mr. Dowling, who has lost both legs, half his left arm, and half his right hand, has risen in life from a state of poverty to that of president of the largest bank in Minnesota, and boasts that he can do everything in life except tie a bow-knot in his tie. In spite of his disabilities he won his bride against two whole-limb competitors, and is the father of healthy children.

PLAGUE AT LIVERPOOL AND AVONMOUTH.

THE Ministry of Health announces a fatal case of plague in Liverpool, in a bargeman. From the same source we learn that on the arrival of the s.s. *Framlington Court* at Avonmouth from Montreal on July 22nd, one of her officers, who was ill, was removed to the isolation hospital suffering from bubonic plague. Another officer, we are informed, having suspicious symptoms, was taken to hospital the following day and has been found also to be suffering from the disease. The vessel came from Alexandria to Montreal and called at Sydney, Nova Scotia, on her voyage to Avonmouth. She is being detained by the Bristol Port Sanitary Authority. All the accepted precautions have been taken, while the circumstances are being investigated.

GOVERNMENT SALARIES.

A VACANCY is announced for a medical inspector of factories who will be required to undertake medical inspection, under the direction of the senior medical inspector, in factories, workshops, and other places under the Factory Acts. The salary offered is £500 per annum, rising by annual increments of £20 to a maximum of £700 per annum, these figures being exclusive of war bonus; and the appointment is subject to the usual Civil Service regulations as to retirement and pension. The scale of salary will certainly be criticised at the present moment, when the salaries to be obtained in so many directions are considered, as well as the diminished and diminishing purchasing power of the sovereign. We may, however, remind intending candidates that the war bonus to be added to the salaries will be equivalent to an additional one-third, making, roughly speaking, the salaries nearly £700 and over £900 respectively. These, also, are not generous figures, but if the pay is maintained at that rate, and if proper account is given to the value of the pension, the salaries are not distinctly lower than those attached to many Civil Service appointments. It will, of course, be remembered that a war bonus is a distinctly conditional sum, and with a fall in prices might be arbitrarily withdrawn. We cannot attempt to estimate the measure of this risk. But the Home Office must be served, and therefore it must pay salaries comparable to those paid by other departments. Having regard to the sums mentioned in connexion with posts in certain of the new bureaux, we feel that if the Home Office should later attempt to reduce the salaries which it is now offering it would be involved in a difficult struggle. Moreover, we should expect the salaries of medical inspectors of factories not to come down, but to go up in response to the increasing knowledge of the nation that on trade production depends our very life, while on healthy workers depends our trade production.

THE MENTAL NURSE'S WORKING DAY.

IN a recent number of THE LANCET (July 19th) we referred at some length to the conditions of asylum service in so far as these affected medical officers. The head of a large establishment dealing with one group of the mentally infirm calls our attention to another aspect of the matter—namely, that of the nursing of these patients. This question of mental nursing has been under consideration lately by the various authorities, with whom rests the responsibility of making suitable provision; and the two especially concerned with London, its County Council and the Metropolitan Asylums Board, have now adopted proposals for reducing considerably the hours of duty of the staff employed in their institutions. There is, of course, no parallel between ordinary industrial conditions and those of nursing, and many difficulties arise from the inability of certain workers to appreciate this fact. It is, therefore, not surprising that the two bodies just mentioned are experimenting on different lines, and it will be interesting to see which solution of the problem is found the more satisfactory. The County Council has adopted a three-shift system, each shift averaging eight hours on each of six days a week, while annual leave of 14 days is granted. In the institutions controlled by the Metropolitan Asylums Board the weekly total of hours worked is to be 50, spread over five days in each week, while four weeks of annual leave are to be given. The total number of hours on duty is the same under both arrangements—i.e., 2400 per annum. Both methods have their own drawbacks, and other schemes drawn up by other authorities are open to objections probably of equal weight. The chief requirements are to have a sufficient staff on duty at all times without having a superfluity at particular hours, and to provide that every ward shall have a responsible officer in charge of its equipment without its being necessary to check the stock twice a day or oftener as the change over is made. Since the working day, as distinct from the bedtime of the patients, must ordinarily extend over 14 hours—that is to say, 98 hours per week—it will be seen what a gap has to be filled when a charge nurse or attendant is only on duty for 48 or 50 hours. To keep patients in bed 12 hours out of the 24 is feasible in some instances, but can hardly be regarded as a good arrangement for young and active persons. Much will turn upon the spirit in which the staff take advantage of their extended freedom, but if the concessions made now are merely to serve as the basis for further demands the public practice of charity towards the weaker brethren is likely to prove an expensive luxury.

PSYCHIATRY A HUNDRED YEARS AGO,

WITH SOME COMMENTS ON THE PROBLEMS OF TO-DAY.[1]

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IN the latter part of the reign of George III. many treatises on insanity were published, many of them possessing much literary grace. They abound in details of clinical cases, including frequently the appearance on post-mortem examination. Probably the public interest taken in the King's illness helped to stimulate this remarkable output. The volumes are full of interest, containing much that is wonderfully modern, yet it is not easy to enter into the spirit of the age, which was one of conflicting doctrines, old and new.

Blistering and Blood-letting.

During the early part of this period medical treatment was based on the hypothesis that acute insanity was due to inflammation of the brain and its membranes; and it was considered necessary, by whatever method, to reduce the supply of blood to the brain. This can be illustrated by the treatment of George III. himself. It appears that his physicians were unanimous only on one occasion, when they decided to blister the King's legs to relieve his acute excitement! We are told that no beneficial result seemed to follow this operation.

Similarly, the practice of blood-letting was considered of great value. In 1811 Crowther, the surgeon to Bethlem, claimed to have bled 150 patients at one time, without untoward result. He also recommended emetics, quoting a case of hypochondriacal melancholia relieved entirely by their use. The patient took 61 vomits in the course of six months, and for 18 nights one every evening, yet made a perfect recovery! This view of the pathology of mania was supported by the post-mortem findings, which frequently described hæmorrhagic points in the substance of the brain

The Treatment of Insanity.

The treatment of insanity was founded on the anti-phlogistic theory, which at that time was generally held, and we must not pass hasty judgment on those who conscientiously accepted it. In our own times theoretical considerations have suggested methods of treatment that may be criticised adversely by our successors. For instance, since convalescents frequently possess an increased number of white blood-cells, it has been suggested that an artificial leucocytosis might promote recovery, and turpentine has been injected in order to produce an abscess. This line of treatment is founded on the gratuitous assumption that the leucocytosis in the two cases is similar in nature. The underlying thought is akin to that of Dr. Joseph Mason Cox, who recommended inoculation with small-pox, or the itch, and who said in his "Practical Observations on Insanity," published in 1804:—

> "Certain it is that if any considerable commotion, any violent new action, can be excited in maniacal complaints, by whatever means, the mental derangement is often permanently improved."

This little book formulates the teachings of the whole school very concisely. It professes to state rules which will lead to "a more humane and successful method of cure," yet it offends the modern reader from start to finish. We are told that it is essential, in management, to procure the confidence of the patient, or to excite his fear. Pious frauds are recommended, and the case is recorded of a gentleman who imagined that his housekeeper had tried to murder him by means of poison in his shirts. It was arranged that she should be arrested, and dragged away in his presence; a bogus analysis of his shirts was made, which confirmed his suspicions; antidotes were prescribed, and he recovered in a few weeks.

Still more objectionable is the next method, which Cox strongly recommends—the use of a circular swing, invented by Dr. Erasmus Darwin, by means of which a patient, firmly strapped down on a chair or a bed, could be made to rotate round a central beam at any desired pace. It is only fair to say that Cox gives most impressive instances of the marvellous cures accomplished, apparently, by the swing. It was recommended by many other physicians of experience, and in Morrison's lectures, published in 1828, an illustration of it was given, that every private asylum might be properly equipped.

The striking change in the treatment of the insane which began in the eighteenth century can be traced to three causes. First, there was the great humanitarian movement, which awakened sympathy with all human suffering; secondly, there was the gospel of liberty, equality, and fraternity preached in France, which penetrated even to the prison asylums of Paris; and, thirdly, there was a gradual enlightenment of medical opinion. So far as I can ascertain, actual priority in asylum reform belongs to Italy, where, between 1774 and 1778, Vincenzo Chiarugi, assisted by Daquin of Chambery, introduced new methods in Florence.

But the premier place in reform belongs to Philippe Pinel, who not only transformed the conditions at the Bicêtre and Saltpêtrière in Paris, but convinced the world by his writings that the old methods were wrong and futile. His work on Mental Alienation, published in 1801, constituted a fresh departure. He was the hero of a wonderful chapter in the history of medicine, especially as his reforms were carried out during the darkest hours of the French Revolution. It was to the terrorist Couthon, who suspected him of harbouring aristocrats, that he made the remark which stands true for all time: "Citizens, I have a conviction that the insane are only intractable because they are deprived of air and liberty!" The same day he removed the chains from 50 of his patients.

"*The Retreat*," *York.*

To pass to our own country, the Retreat, in York, was opened in 1796, long before Pinel's work was known here, through the united efforts of William Tuke and Lindley Murray, both members of the Society of Friends. The latter contributed much, in a quiet way, to the project; but the energetic, strong-minded William Tuke actually carried it through at the age of 60, and in spite of much misunderstanding and opposition. Even his wife is reported to have said, "Thou hast had many children of thy brain, William, but this last one will be an idiot!" In 1812 his grandson, Samuel Tuke, published "The Description of the Retreat," and Sydney Smith drew attention to it in a delightful essay, "Mad Quakers," which appeared in the *Edinburgh Review*.

The Retreat was fortunate in its first physician, Dr. Thomas Fowler, a man of keen scientific spirit, devoted to experimental research. He introduced the solution of arsenic known everywhere as Fowler's solution. He left in manuscript notes of 6000 cases, recited concisely and without bias, both failures and successes. Any drug or therapeutic agent which he investigated was administered singly, under conditions as similar as possible, but, to quote Tuke's description, he was "led to the painful conclusion, painful alike to our pride and to our humanity, that medicine as yet possesses very inadequate means to relieve the most grievous of human diseases." That conclusion, I fear, still holds good.

I should not like to convey the false impression that the Retreat was the only institution in England conducted on humane and enlightened principles; the report to the House of Commons in 1815 gives a very favourable account of Laverstock House, Salisbury, and Brislington House, Bristol. Both Pinel and Tuke stood for a complete change of outlook, involving not merely the abandonment of brutal methods of coercion, but the application of a new principle, which they called "moral treatment." By this they claimed that more could be done for the insane than by drugs and discipline. They asserted that the psychical environment of a patient was no less important than his physical condition.

Problems of To-day.

To come to some of the problems that still vex us to-day. A hundred years ago only three sedative drugs were in use—opium, hemlock, and henbane, and opinion was greatly divided as to their value. Haslam strongly condemned opium, while Pinel suggested that experiments should be made in the use of various drugs, with proper attention to the specific distinctions of insanity. At present more than a hundred sedatives are advocated for sleeplessness or mental excitement, and the problem of their use is more complex than ever before. It is, of course, recognised that chemical

[1] Abstract of the Presidential Address to the annual meeting of the Medico-Psychological Association of Great Britain and Ireland, held in York, July 22nd, 1919.

restraint is generally hurtful, that drug habits are easily acquired, and that sedatives dull the faculties and mask symptoms. Moreover, all physicians in hospitals for the insane know that many newly admitted patients will not recover until the hypnotics given before admission are withheld. Yet, even now, we have no clear and satisfactory data. The extreme opinion of Haslam is shared by many present-day physicians. Prominent among these is Dr. C. K. Hitchcock, formerly the medical superintendent of Bootham Park, York, who, in 1900, published a striking article in the *Journal of Mental Science*, summarising the results of treating 206 cases of acute mania with no sedatives whatever. During the period in which he refrained from their use the rate of recovery was a high one.

At the Retreat we only use narcotics when ordinary measures have long been persevered with and have failed. It is only fair to say that in some exceptional cases great benefit has seemed to follow. Sometimes the intensity of mental suffering calls for immediate relief, even if only temporary. The problem is to find out the value and the limitations of sedative drugs. I think that members of our association could investigate this problem to good purpose. Our patients live under very uniform conditions; in the nursing staff we have trained observers, and the inquiries could be conducted on a sufficiently large scale to eliminate many disturbing factors. At the outset it would seem advisable to limit the inquiry to groups of cases in which psychical factors in ætiology are of secondary importance, such as acute delirium, the nocturnal excitement in senile insanity, or the agitated melancholia of the climacteric. Two such groups might be compared; one taking no drug, the other any drug that might be selected. I am sure that results thus obtained would be of greater value than the individual opinions of even the most observant people.

The Drink Question.

Another problem which confronted physicians at the beginning of the nineteenth century is still painfully present with us. It is the alcohol problem. The wastage from intemperance is incalculable, yet we face increasing industrial competition with nations such as the United States, which are relatively abstemious. The word inebriate is unfortunate, as it suggests actual drunkenness, whereas there may be dangerous alcoholic addiction without gross signs of intemperance. This morbid condition, of course, is essentially the concern of psychiatry. It is virtually a disease, although when the exciting cause is removed no symptoms may be discovered.

Experience tells us that the potential inebriate should be treated early, or there will be no hope of preventing confirmed addiction. But the Inebriate Acts are practically useless in the first stages of the disorder. If early treatment is to be obtained it must clearly be on a voluntary basis and in strict privacy, for no one can afford to be branded as an alcoholic.

If the suggestion of Mr. Theodore Neild, of Leominster, were adopted, and a consultation bureau were established in every large centre, much might be done.

Clinics for Early Treatment of Mental Cases.

But inebriety and drug addiction should not be considered apart from other forms of mental instability. The legislature is taking up the subject of the establishment of clinics or hospitals which will provide early treatment for unconfirmed mental trouble; and the proposed consultation bureaus might be affiliated with these new clinics or form a special department of them.

Unfortunately, many patients decline all treatment and refuse any advice. For these some form of compulsion should be possible. I suggest that any new laws relating to inebriety might provide three separate procedures in dealing with such patients. First, a judicial warning, which might be given privately, when the justice has satisfied himself that the patient is in grave danger of alcoholic or drug addiction. Secondly, if warning and advice failed, the appointment of a guardian, who would be legally authorised to stop supplies, to forbid the sale of liquor to the patients, and to restrict his liberty within prescribed limits. Thirdly, internment in a farm colony or other approved home.

Progress of Psychiatry.

In comparing the psychiatry of 120 years ago with that of to-day it would be easy to show that progress has been slow and disappointing. No specific treatment of mental disease has been discovered, save in the case of that arising from thyroid insufficiency; and it is doubtful whether the recovery rate has improved. It is probable that, a century since, the condition of patients in the more enlightened institutions did not greatly differ from their condition to-day.

The medical literature of that period, moreover, contains much that anticipates modern teaching. Haslam, for instance, describes both dementia præcox and general paralysis. The essential mystery of mental disease baffles us now as it did then. Nevertheless, we have achieved a great deal. A vast amount of progress has been made in the anatomy and physiology of the nervous system, in pathology, bio-chemistry, and in many departments of science which intimately affect our subject.

War Neuroses.

The war has thrown some light upon one aspect of it. We have learned that symptoms formerly termed hysterical or functional are not peculiar to the frail or sensitive, but occur in strong men, that they continue long after any recognised exciting cause has ceased to operate, and that they frequently disappear suddenly as if charmed away. Unfortunately, we cannot analyse the causes of their disappearance, which is ascribed to multifarious agencies, suggestion, psycho-analysis, faith-healing, hypnotism, and ordinary hygienic measures. There is no organic lesion, and the illness, though often accompanied by physical disability, is clearly a disorder of the mind rather than the body. There is urgent need to establish a scientific therapy, that appropriate treatment may be selected with confidence.

We have learned, too, that the functional element in definite organic maladies must not be overlooked. Patients with certain diseases, such as disseminated sclerosis, frequently present symptoms that do not correspond to the extent of the organic lesion.

Conclusions.

These observations may throw some light on various problems of psychiatry. Do not many of our sudden recoveries correspond to the recoveries in the psychoneuroses? Are not many of our chronic cases akin to that of the confirmed neurotic, with this difference, that in the one, the disordered function affects intelligence and emotion, and in the other some lower nervous mechanism such as vision and muscular coördination? This thought, of course, does not carry us far, but it suggests that the study of hysterical phenomena may help us greatly, and it reminds us to lay due stress on psychical, as well as physical, factors, in the ætiology of mental disease, the attempt to separate mental and bodily factors must inevitably lead to error, since they constantly react on one another.

Be this as it may, we have, at any rate, left behind the doctrine expressed in the dictum: "All insanity is either toxic or traumatic." Just as Tuke and Pinel considered moral treatment of paramount importance in promoting recovery, so we recognise the profound importance of mental strain in the causation and development of certain forms of mental disorder.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Mobilised Students and their Medical Studies.

WAR has left cruel gaps in the student ranks of all professions, especially perhaps of medicine, for all young robust medical students were sent to the very front, whether to the aid-posts or among the squads of stretcher bearers. The survivors are, on account of their age, still mobilised for one or two years, since the term of compulsory service is three years. A large number of older students due for more or less immediate demobilisation are kept, since the armistice, by the Army of Occupation in Germany. The War Minister, at the request of the heads of the medical profession, has repeatedly taken steps to ensure the return of these students and the completion of their term of service in a town with a medical school. In December, 1918, he gave instructions for the recall of all students mobilised 54 months—i.e., already in military service before the war—and of others mobilised 51-53 months who had served

32 months or more in a company of infantry or a squad of stretcher bearers, or had been wounded short of being invalided out. Unfortunately, these limited measures affect only a handful of individual students. The Ministry of War is, in fact, placing great obstacles in the way of their repatriation. A recent decision, ostensibly an improvement on the earlier, introduces only nominal alterations. It adds to the categories already cited medical students of any age posted to other duties than those of the Service de Santé—students, that is, who preferred to enter the infantry, artillery, or air force to making use of their medical training—a very limited number in all. The medical societies and faculties have resolved that all medical students without exception shall be recalled to continue their medical service at some town containing a medical faculty, where they can pursue their studies and still perform garrison duty.

Requisition of Civil Doctors.

To ensure medical care in regions deprived of doctors by mobilisation the Ministry of War during the two years preceding the armistice had charged with this service mobilised medical men of the later age-groups. These men are now almost all demobilised, and in order to supply their place in localities where the population is scanty or largely indigent the Minister has decided to avail himself of the service of civil volunteers, offering them a monthly stipend of 300 fr., capable of increase in exceptional cases.

Acoustic Troubles in Musicians.

Dr. Castex has published an intriguing study of the auditory disturbances found in musicians. These are not infrequent, but the author has failed to determine whether the practice of the musician constitutes an actual predisposition in comparison with other occupations. He recognises that the hearing of musicians acquires a special acuity, a fact sufficient perhaps to explain its fragility. Certain musicians, for example, perceive at the same time as the note struck the whole gamut of natural overtones. Among the disturbances noted by M. Castex, some concern the timbre, others the pitch, and others again the intensity of the sound. Sometimes a slight degree of sclerosis only allows of the perception of shrill notes or of the deep tones of the brasses. In other cases there is double audition, the two ears perceiving a different note, the interval between them varying from a semitone to an octave. Others are victims of persistence of the notes, as though the loud pedal of the piano is depressed. Modifications of timbre make the tone metallic or nasal in quality. Painful increase in audition is not uncommon among deaf musicians. They may fall in a faint as a result of intensely loud notes (organ, fanfare of trumpets), when the ear has lost its damping mechanism. The prognosis of these affections depends on the fleeting character or otherwise of the auditory affection, but it is to be noted that incomplete deafness does not prevent a good musician from appreciating the diverse turns and qualities of notes. On the deafness of celebrated musicians, Jean Jacques, Schumann (obsessed by a *fa*), Beethoven himself, it is difficult to express an opinion in the absence of a technical examination, but—and therein is well seen the secondary rôle in music of the sense of hearing—the finest works of the master were written after he had become finally deaf, when (as he wrote himself) "he knew the divine hour in which the composer hears nought but his musical inspirations."

DEATH OF THE HON. TARAVETH MADAVAN NAIR, M.D. EDIN.—Dr. Taraveth Nair, who died in London recently, was prominent in Madras both as a medical man and a political thinker. Educated at the University of Edinburgh, he graduated M.B., C.M., in 1894, and was for some time house surgeon at the Sussex Throat and Ear Hospital, Brighton. In 1896 he proceeded to the M.D. and C.M. degrees of his university, and on his return to India he became a political leader with no little influence. He arrived in London a few weeks ago in a serious condition of health, and succumbed to diabetes, a disease on which as recently as 1914 he had published. This book is a conscientious and careful summary of our present knowledge and theories. In consequence of the frequency of diabetes in India Dr. Nair was of the opinion that organised research into the ætiology and pathology of the disease ought to be conducted in that country on the lines of the anti-tuberculosis campaign in England.

WOMAN IN INDUSTRY.

(*Concluded from p. 169.*)

LAST week we summarised the memorandum by Dr. Janet Campbell on the Health of Women in Industry, forming part of the comprehensive Report of the War Cabinet Committee on Women in Industry (Cmd. 135, price 1*s.* 6*d.*), dealing then with the effect of industrial employment, first, on the personal health of the woman worker and, secondly, on the function of motherhood. There remains for notice the important section of the memorandum bearing on the means for mitigating the admitted evils, and here, as before, we follow closely the actual words of Dr. Campbell's very clear exposition.

IV. SAFEGUARDS AND REMEDIES.

During the war the employment of women has been greatly modified. The number of employed women has increased, they have been employed as substitutes for men in men's work, restrictions with regard to hours have been removed—overtime being general at the beginning of the war and night-shifts usual throughout—and wages have increased to subsistence level in almost all cases and in excess of this in some. The result of these changes on the health of women workers has been summed up in a number of memoranda and reports which have been issued by the Health of Munition Workers Committee. An examination was undertaken by this committee of 2500 munition workers with a view to ascertaining the effects of employment on their health. The actual findings were summed up as follows:—

(1) That there is a definite burden of fatigue which, though relatively small in amount as regards severe fatigue, is considerable as regards that of a less severe character.

(2) That the fatigue and ill-health are less than might have been anticipated, having regard to the hours of work and the nature of the employment, and that this is due, broadly speaking, to the greatly improved attention to the health and welfare of the workers.

(3) That fatigue and sickness are greatest where heavy work is combined with long hours at the factory and associated with onerous domestic duties after factory hours.

(4) That unless brought under control the considerable amount of moderate weariness and ill-health now present is likely to reduce immediate efficiency, and also exercise, in many cases, an injurious effect on subsequent health and on capacity for maternity.

Dr. Campbell's comment on these findings is as follows:—

"The fact that the women were able to stand the work as well as they did was attributed (*a*) to good wages, enabling them to feed and clothe themselves properly; (*b*) to healthy conditions in the factories; and (*c*) to welfare and health supervision, including the provision of protective clothing, canteens, rest-rooms, surgeries and medical advice. It may confidently be asserted that if similar demands had been made upon women working under pre-war factory conditions they could not have been met to the same extent, if, indeed, they were met at all, without causing an immensely greater amount of fatigue and permanent injury to the health of women and girl workers. As it was, most women enjoyed the more interesting, active and arduous occupations, and in many cases their health improved rather than deteriorated. Medical officers of factories and welfare supervisors have pointed out the beneficial effects of open-air conditions (yard work, trucking in filling factories, &c.) on the general health, and the success with which properly selected women have undertaken work involving the lifting of weights, heavy machine work, and even forge and foundry work, without untoward physical consequences. The whole experience tends to show that light sedentary work is not by any means always the most suitable for women, that operations involving a change of posture are preferable, and that, given adequate nutrition, many women would have better health and greater physical vigour if they followed more active occupations."

Restrictions on Women's Labour.

The question of restrictions on women's labour then claims attention. The Health of Munition Workers Committee examined a number of witnesses on this point.

Various of these witnesses, Dr. Campbell tells us, urged the abolition of all special protective legislation for women after

the war. They consider that women ought not to be prevented on physical grounds from entering any trades open to men (unless sex injury can be proved, as in the case of lead poisoning), or from working similar hours to men, or from engaging in night-work. It is suggested that the conditions of employment should be improved for men and women equally and that it is unfair to handicap a woman economically by restricting the conditions under which she may work. There is some truth in these arguments, but, on the other hand, it should be remembered that women as a class are still, unfortunately, unorganised and therefore in a far more helpless position than men in the face of unreasonable demands on the part of unscrupulous employers; to abandon all restrictive legislation might still lead to the exploiting of women and the return of some of the abuses which this legislation was designed to remove. The women factory inspectors examined were unanimous in desiring the re-imposition of some restriction of women's labour, though it was considered that a revision of the Factory Acts was desirable.

Shorter Hours.

The general opinion of the witnesses examined appeared to be that a 44-hour week was advisable for women, with a Saturday half-holiday. Attention was called to the advantage of a short break in the morning spell, especially when work begins early and where there is no breakfast interval, as workers often have no time for a proper meal before leaving home. In the Report of the Chief Inspector of Factories and Workshops for 1917, which Dr. Campbell quotes, Mr. Bellhouse discusses the advisability of commencing work after instead of before breakfast, and sets out the following results of the experiment at Paisley, which are typical of the findings elsewhere:—

(1) Bad time-keeping in the morning has almost disappeared.
(2) Sickness amongst the girls in the first hours of the morning, which was common when work started at 6 A.M., has largely ceased.
(3) Reduction in output is hardly noticeable in departments where it depends on the activity of the worker, and not in proportion to the drop of one hour per day, even in departments where output depends chiefly upon machine hours.
(4) Better work is secured and maintained.

The conclusion drawn is the eminently reasonable one that shorter hours would result in better time-keeping, especially where married women are concerned, and that in most trades and processes output would not suffer and might even improve.

Night Work.

Night-work, also, comes in for its share of condemnation in Dr. Campbell's memorandum. The conclusion arrived at from the examination of competent witnesses was that it should not be permitted to women after the war, and, in the case of men, it might also be injurious and should never be resorted to except in case of necessity. Night-shifts, and especially permanent night-shifts, Miss Martindale pointed out, were particularly harmful to women with domestic responsibilities, as it was more difficult for them to obtain adequate sleep; they invariably did their own house work during the day and their rest was subject to continued interruption; their work became inferior in quality and their health suffered. Evidence showed that overtime had an injurious effect on workers, and, if continued for a long period, reduced rather than increased the output. It was particularly injurious to girls of 14 to 16 years of age and to women between 30 and 40.

Although some regulation of women's labour is thus likely to be continued after the war, Dr. Campbell foresees the time when the need for special protection for women and girls will disappear in large measure, a revision of the existing Factory Acts leading to a levelling-up of the conditions under which men work to the standard which is now considered desirable for women.

Medical Supervision.

The whole position in regard to medical supervision is then surveyed. Provision for medical inspection and supervision has already been made by the local education authority for persons up to 18 years of age. It is presumed that every boy and girl will have been under regular medical care and supervision during the whole of school life and will have received treatment for such physical defects as have revealed themselves. With regard to industrial workers direct supervision was almost non-existent before the war. Experience of war conditions has emphasised the need for more effective supervision and for energetic research into the causes of industrial fatigue and the methods of preventing disease directly or indirectly due to occupation. Factory hygiene must, indeed, become an integral part of the general system of preventive medicine, which is likely to be the most important branch of medicine of the future. For this purpose an adequate service of factory medical officers is needed, having no duties of treatment, but charged with the general oversight of factory conditions, hygiene, and health. With this may be associated the "welfare" service in individual factories, responsible to the factory management, and partly occupied in carrying out recommendations made in regard to the health of the workers.

The duties of the factory medical officers, as sketched out in the memorandum, comprise the supervision of (*a*) the general hygiene of the factory, including sanitation, ventilation, lighting, heating, &c.; (*b*) the particular hygiene of processes likely to involve hazard, discomfort, or injury to workers; (*c*) the maintenance of surgeries, first-aid equipment, rest-rooms, &c; and (*d*) the general health and welfare of the workers, men, women, and young people, with particular regard to the conditions under which women and young people are employed. Further, it should be the duty of the factory doctors to investigate and report upon any trades, processes, or forms of work which appear to lead to general or specific ill-health or to shorten unduly the lives of workers employed therein. They should act in an advisory capacity only, and should not undertake the treatment of disease in any form.

As to the administration of factory supervision Dr. Campbell writes:—

"Such a service might conceivably be established centrally under the Home Office, and locally under the sanitary authority. This would presumably entail the formation of a strong central Medical Department at the Home Office, staffed by men and women doctors, and the appointment of a considerable number of medical officers (women as well as men) to act as local medical inspectors of factories. The nucleus of such a service might possibly be drawn from the ranks of the certifying factory surgeons, whose present duties would obviously be superseded in one direction by the school medical officers, and in the other by the factory medical inspectors. The suggested means of providing for the medical inspection of factories would make it necessary to enlarge the powers and duties of the medical officer of health in connexion with factories and to provide him with a sufficient staff to undertake their adequate inspection and supervision, this branch of his work being under the general control of the Home Office in much the same way as the medical officer of health in his capacity of school medical officer is under the supervision of the Board of Education. Such an arrangement would have the obvious advantage of combining in one local administration the whole of the powers and duties relating to health in any one area, of preventing overlapping of function, and of promoting smooth and rapid action."

Concerning ante-natal and post-natal employment, such evidence as there is suggests that suitable employment under reasonably good conditions is beneficial rather than harmful. As the result of an investigation undertaken by the Women's Industrial Council into the "quality of maternity" in relation to industrial occupation, it was stated that there was practically nothing to choose in quality of maternity between those who went to work and those who stayed at home. Medical witnesses agreed that light factory work was not in itself objectionable, and that it was better for a woman to work than to be under-fed.

For the sake of the mother and the child it is clearly desirable, the Memorandum states, that the mother should have not less than one month of ease and comfort in order to complete her own recovery, and that she should be in a position to nurse her child for the normal period. No extension of Section 61 of the Factory and Workshop Act of 1901 will in itself secure this unless at the same time financial assistance is given to the mother to enable her to remain at home without anxiety.

Grants in Aid of Maternal and Infant Welfare.

In order that women might be enabled to refrain from work at least sufficiently long after their confinements as to ensure

the proper care of their infants, it was suggested, in the evidence taken by the Health of Munition Workers Committee, that the desired end could be reached by means of adequate grants in aid made to the mother at the time of and subsequent to her confinement. It was the general opinion that these grants should be non-contributory, that they should be available for all women below the income-tax limit (some witnesses preferred to impose no limit), that they should preferably cover a period of nine months after confinement and perhaps one or two months before, but if the cost of this was prohibitive, that they should be for periods of six or three months after confinement, the three months after being regarded as the most vital period. It was recommended that a mother in receipt of grants should be prohibited from seeking employment away from home.

The probable expenditure involved in several alternative schemes was estimated. If grants were given it was considered that they should be available for all women now entitled to maternity benefit, and to these should be added the wives of men who were excepted from insurance under the Act, as there would be no logical reason for excluding them, and their need was often great. This would cost the Exchequer between 5 and 6 millions a year if the benefit was available for a period of six weeks, and between 11 and 13 millions a year if it was available for 13 weeks. It should not be forgotten that these grants would necessarily be supplementary to the existing benefits under the National Insurance Act.

The specific objects of the proposed grants would be, in Dr. Campbell's words:—

(*a*) To ensure efficient midwifery and nursing at the time of the confinement, and thus to prevent avoidable injury to the mother's own health or to the infant.
(*b*) To enable the mother to secure adequate nutrition and to obtain the period of rest necessary for complete recovery after confinement.
(*c*) To reduce infant mortality by ensuring as far as possible regular breast-feeding and the personal care of the mother.

The Memorandum does not rashly assume that the grants would have these desirable effects. If the professional fee were increased it does not follow that more efficient treatment would be obtained, and money spent on the untrained nurse or handy-woman is useless if the intention of the grant is to ensure skilled nursing. It is also doubtful whether grants would make a substantial difference on the infant mortality rate apart from improvements in domestic hygiene, housing, and environment.

What actual difficulties might arise in practice the Memorandum frankly discusses, and with a transcript of these passages we close our survey:—

"The administration of such grants would be difficult and costly. At present there is no machinery for this purpose, though a nucleus might be found in the staff of the local sanitary authority. Presumably the grants would depend on the continued breast-feeding of the infants, a matter not easy to prove. Visits of inspectors (possibly health visitors) to the home, or of the mother to the maternity or infant welfare centres would be necessary, but even so, little control could be exercised over the spending of the money, especially in the later months. If the grants covered a period of six months or longer no mother could be expected to spend the money on herself or on her own food, it would almost necessarily be merged into the family income. The family, as a whole, would gain in consequence, but though this would be a valuable result as far as it went, it would not be fulfilling the express purpose of the grants and might be obtained more satisfactorily in other ways.

"On the whole, the precise effect it is desired to obtain would either not be obtained or would be obtained only in part, while the cost of the improvement made in maternal health and infant welfare would probably be out of all proportion to the results.

"The main criticisms in regard to maternity benefit are that it is an *ad hoc* unsupervised grant, entirely unrelated to municipal provision for maternal welfare and not available for a certain number of women who are perhaps particularly in need of it. Further, it is administered under the Insurance Act by Approved Societies and not by the sanitary authority. Instead of setting up a new system of maternity grants overlapping the existing maternity benefit and administered by another Department of State, maternity benefit should be transferred to the sanitary authority; it should be placed on a non-contributory basis, made available for all women under the income-tax limit and increased to at least the 60*s.* now paid to the employed wives of insured men.

"It is idle to expect much improvement in the professional care of the mother and child until we have wholly efficient medical and midwifery services, in addition to a more just and equitable distribution of maternity benefit. Such services could only be organised under a competent health authority. It is essential that the mother should be able to secure a doctor or midwife, whichever she prefers, whose qualifications in this respect are beyond dispute. Further, there should be a full exercise by the sanitary authority of the powers which already exist for the provision of food and milk, advice and treatment for mother and child, health supervision, &c., and their extension as and when found necessary.

"It is submitted that the provision of large grants in aid, with no assurance that they will be applied to the specific purposes for which they were awarded, is an unscientific method of dealing with the problem of maternal and infant welfare, and that in any case to give such grants before securing an adequate health and medical service is unsound administration. If grants or pensions in addition to a revised maternity benefit prove to be necessary, it would be suitable to entrust the administration of such grants to the central and local health authorities responsible for the public health service."

In this short account of the Memorandum many interesting and instructive details have had to be omitted. Anyone interested in the subject would be well repaid for the time spent in the perusal of the whole Memorandum—indeed, of the whole Report.

URBAN VITAL STATISTICS.

(Week ended July 26th, 1919.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had been 10·0, 10·1, and 9·0 in the three preceding weeks, rose to 10·3 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the annual rate was 10·5, or 1·3 per 1000 above that recorded in the previous week, while among the remaining towns it ranged from 3·0 in Swindon, 3·8 in Gloucester, and 4·4 in Lincoln, to 15·1 in Bootle and in Bury, 15·5 in Darlington, and 19·7 in Carlisle. The principal epidemic diseases caused 134 deaths, which corresponded to an annual rate of 0·4 per 1000, and included 54 from infantile diarrhœa, 33 from diphtheria, 22 from measles, 12 from whooping-cough, 11 from scarlet fever, and 2 from enteric fever. Measles caused a death-rate of 1·2 in Newcastle-on-Tyne, 1·6 in West Bromwich, and 2·2 in Barnsley. There were 2 cases of small-pox, 1526 of scarlet fever, and 1140 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 5, 1438, and 1100 respectively at the end of the previous week. The causes of 21 deaths in the 96 towns were uncertified, of which 5 were registered in Birmingham, 4 in Gateshead, and 2 in Liverpool.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality, which had been 9·9, 11·0, and 10·6 in the three preceding weeks, rose to 11·1 per 1000. The 222 deaths in Glasgow corresponded to an annual rate of 10·3 per 1000, and included 5 from whooping-cough, 4 from measles, and 2 from infantile diarrhœa. The 82 deaths in Edinburgh were equal to a rate of 12·7 per 1000, and included 3 from diphtheria, 2 from measles, and 1 from infantile diarrhœa.

Irish Towns.—The 89 deaths in Dublin corresponded to an annual rate of 11·5, or 2·5 per 1000 above that recorded in the previous week, and included 2 each from diphtheria and infantile diarrhœa. The 92 deaths in Belfast were equal to a rate of 12·0 per 1000, and included 2 from scarlet fever and 1 from infantile diarrhœa.

NATIONAL LEAGUE FOR HEALTH, MATERNITY AND CHILD WELFARE.—The following resolution was passed unanimously by the League at its last meeting:—

"That this League calls upon the Government to continue some reasonable control of the liquor traffic in the interest of the health and welfare of the mothers and infants of the nation."

The National Association for the Prevention of Infant Mortality, a constituent section of the League, has passed a resolution dealing with the milk-supply:—

"That this Association calls the attention of the Government to the urgent necessity for reconstruction of the milk-supply throughout the country, with regard to (1) its greater purity, (2) freedom from infection, and (3) its seriously diminishing volume. This Association would remind the Government that both the quality and quantity of the milk-supply of the United Kingdom are at present in a deplorable state, and that the earliest attention to the problem is vital to the babies and children of to-day, who will bear the burden of Empire in the future."

Correspondence.

"Audi alteram partem."

THE COÖRDINATION OF CLINICAL RESEARCH: THE POSITION OF PSYCHIATRY.

To the Editor of THE LANCET.

SIR,—In THE LANCET of June 21st a letter appeared from me under the above heading, in the course of which I expressed the view that the time was ripe for a conference between local authorities responsible for the care of the insane, the governing authorities of the local university, and of the infirmary, and representatives of the Board of Control, with a view to the establishment of a clinic in psychiatry. Since that date such a conference has taken place in Cardiff, at which the main features of the proposed amending Bill to the Lunacy Laws (which will allow of treatment in early cases of insanity without orders and certificates—in fact, will permit of the establishment of these clinics) were outlined, and the lines upon which the clinic could best be developed in Cardiff were sketched. I understand that similar conferences have been held at Newcastle and at Oxford, and I believe will be held at other university centres. The proposed amending Bill has not yet been adopted by the Government. It may be expected that the proposition will be that the Government should find, say, 50 per cent. of the cost of maintenance, and perhaps as much of the annual charges for liquidation of the capital expenditure, the local authority finding the balance. The answer to the question, Who is to find the money for site and erection of the buildings? is not forthcoming that I know of. I cite from the *Western Mail* of July 18th as follows, in regard to the Cardiff conference:—

> The conference was unanimous in the view that a clinic in psychiatry was absolutely necessary, alike in the interests of all sections of the community, and of teaching; and it was resolved that a committee of the authorities represented be formed, to act with the advice and coöperation of the Board of Control, to promote the object in view.
>
> It is obvious that the development above outlined is one of the first importance to the community at large, aiming, as it does, at the prevention of what is probably the most terrible of the ills to which the flesh is heir. In the erection of these clinics, each locality concerned must, in the main, bear its own burden; and there is, therefore, scope for the exercise of that spirit of munificence on the part of private individuals which has never failed to manifest itself in South Wales when an appeal has been made on behalf of suffering humanity.

Some account in due course will be given of the experience gained in treating some 1700 cases of mental disorder amongst troops at the Cardiff City Mental Hospital in its capacity as the Welsh Metropolitan War Hospital (Mental Division). These cases have been admitted and detained on the authority of Army Council Instructions ("for observation and disposal"), but without any orders or certificates or formalities of any kind. I wish I could convey some idea of the gratitude and relief which the relatives of these men have experienced and expressed for this blessed immunity. Yet very large numbers of these patients, had they not been serving soldiers, would have been placed under orders and certificates and have gone through the channel of the Poor-law. Allow me the following citation from a letter just received from a distinguished American psychiatrist, to whom I complained of the woeful backwardness of this country in psychiatry:—

> "Perhaps, as a native of England, I may agree with you, without offending taste, that British psychiatry is behind the times in many respects. The Phipps Clinic at Johns Hopkins and the Psychiatric Hospital in Boston have both been stimulating factors in advance, not to mention several other like institutions."

Are we to understand that this (still great) country will continue, either through poverty of ideals or poverty of purse, or both, to remain passive in this matter, and recognise no obligation as a State in regard to the actual finding of money for the erection of these clinics, but relegate this responsibility to the local authority, or trust to the generosity of those to whom the war has brought wealth? I fear the amending Bill referred to will not be dealt with by the Government this year unless it judges the force of opinion to be such that to ignore it would be inexpedient.

I am, Sir, yours faithfully,

EDWIN GOODALL.

Cardiff City Mental Hospital, Cardiff, July 28th, 1919.

NATIONAL HEALTH INSURANCE AND THE MEDICAL GUILD.

To the Editor of THE LANCET.

SIR,—Dr. Frederick Porter's letter in your issue of to-day, containing the suggestions of the Scottish Medical Guild with regard to National Health Insurance, is a timely one. The bulk of non-panel practitioners are determined not to sell their freedom by entering into contractual relations with Insurance Committees. They consider that their fees, their times and methods of attendance, and so on, are private matters for mutual arrangement between themselves and their individual patients, and that at any time, if the patient or doctor be dissatisfied, either party should be able to bring the professional relationship to an end at once, without any recriminations or charges one against the other. It is this freedom of choice and power to change which gives adequate protection to the interests of both parties. The question of the *freedom* of the medical profession and the public in their mutual relations is the *root* issue in this matter.

The scandal to which Dr. Porter alludes in the latter part of his letter should certainly be brought to an end. It is grossly unfair that insured persons, who in large numbers prefer and are prepared to pay for private medical attendance, should in effect be subjected to a money fine which is distributed gratuitously amongst panel practitioners who have done nothing to earn it. Another way of bringing this scandal to an end would be to permit every insured person who preferred obtaining and paying for medical attendance himself to *renounce altogether* the "medical benefit" portion of the Act, and in consideration of the money loss thereby incurred by him to have his "sickness benefit" (i.e., sick pay while he is prevented by illness from following his occupation) *proportionately increased*.

It is this sick pay that is the most useful and desirable part of the Act for many insured persons. Those who preferred to continue obtaining "medical benefit" on the panel system would, of course, be free to do so, and their sick pay would remain as before.

I am, Sir, yours faithfully,

Hampstead, N.W., July 26th, 1919. HENRY SHARMAN.

THE ORIGIN OF LIFE: THE WORK OF THE LATE CHARLTON BASTIAN.

To the Editor of THE LANCET.

SIR,—Taking note of a letter, published in your issue of May 29th, from the son of the late Dr. H. Charlton Bastian, and of another in the same number from Sir Ronald Ross, referring to the brave battle for the proper discussion of the question of spontaneous generation carried on all his life by Dr. Bastian, I venture to add my tribute to his memory in appreciation of that long life of persistence in the advocacy of a conviction at variance with that of the scientific men of his day.

In the flush of a newly born activity in the field of biology, in the rise of the great science of bacteriology, the illogical deductions made from the facts set forth by Pasteur and Tyndall passed current as a valid and conclusive negation of the reality of abiogenesis. But according to the professions of modern methods in science you can affirm a fact by demonstration, but to deny and disprove an asserted fact is a very different proposition. Pasteur and his followers proved to the hilt that they could destroy life in certain fluids and prevent its resurrection, but that this disproved the possibility of the birth of life in any kind of media in any combination of chemical elements by no means followed. Yet bacteriologists behaved for a generation after Pasteur as though he and his followers had established this position. In the last one or two decades a change has set in and very few men of science make any such claims; a very large number cannot accept the continuity of cosmic processes as proven unless they accept the birth of the organic from the non-organic and the birth of life from the lifeless.

Dr. Bastian some years before his death sent me some salts and solutions, which, combined according to his directions, examined microscopically and by culture to my satisfaction and sterilised by heat under pressure in closed tubes, exhibited after varying periods of time various forms indistinguishable under the microscope from spores and

bacilli. These were not present before the tubes were sealed. They took various stains, some not so deeply, but on the whole offering little ground for discrimination between them and bacteria. They, however, with the culture media at the command of a fairly well-equipped laboratory presented no evidence of growth.

I had no explanation to give other than that advanced by Dr. Bastian, but inasmuch as we were unable to get a culture and because the simple chemical constitution of the fluids in which they appeared was not in accord with what I have been accustomed to associate with the manifestations of life, I was unable to agree to Dr. Bastian's conclusion that these were not merely simulacra of life, but life itself.

He had, as I look at it, the best of the argument on orthodox scientific grounds. I could not explain the results, and insufficient as I regarded the evidence to be I could only oppose to it a disbelief founded on a theoretical objection, the commonly accepted view of life as being made up of complex molecules interacting upon one another and on their environment in such a way as to exhibit continuous orderly proliferation which we designate by the term "reproduction." A current number of *Science* (June 27th, 1919, N.S., xlix., 1278) contains a paper by Dr. MacDougal which deals with the nature of these molecules. Incomplete as was Dr. Bastian's own experimental evidence and that of the work carried out under my own supervision by those skilled and of long experience in bacteriological technique, I was, under the circumstances, able to offer only a still more unsatisfactory report. Full reports of the work of myself and colleagues were made to Dr. Bastian, and doubtless his son can find them among his papers. The conception of the chemical composition of living matter is largely hypothetical, and the utilisation of all known culture media and devices was not performed. I consider Dr. Bastian offered to the world sufficient evidence to make further investigation an imperative duty on those having the requisite skill and the opportunity to continue the work. His conclusions have never been answered in a way to reflect credit on men of science. I am, Sir, yours faithfully,

JONATHAN WRIGHT.

Pleasantville, Westchester County, New York, July 7th, 1919.

To the Editor of THE LANCET.

SIR,—With reference to the recent letters in your columns on the subject of the Origin of Life, I would like to thank all those who have kindly contributed to the discussion and have themselves repeated certain experiments. It would take up too much of your space to reply in detail to all your correspondents. May I point out, however, that Professor W. D. Halliburton is mistaken in supposing that I am not fully acquainted with most, if not all, of the published reports to which he refers. The whole literature of the subject is very familiar to me, not only on account of my father's work, but because I have always taken an interest in the subject myself, and, I hope, without prejudice. Given a primary creation of living organisms, by whatsoever means this may have been brought about in the long-ago past, we are faced with the difficulty of believing that existing micro-organisms are in every case the lineal descendants thereof. It seems, in fact, not unreasonable to suppose that this same genesis of living matter may be constantly occurring to-day under suitable conditions of radiant energy, temperature, season of the year, and suitable combination of the necessary constituents of protoplasm; though, of course, the earliest stages of such a process would necessarily take place beyond our ken in Nature's laboratory, and would be quite invisible even with the aid of the most powerful microscope now available.

With regard to the negative results of the Hon. H. Onslow's researches, referred to by Professor Halliburton, when he says, "This work settles the question of spontaneous generation (in Dr. Bastian's sense) once and for all," it is a significant fact that my father was quite familiar with such simulacra and pseudo-organisms as are described by Mr. Onslow, Prof. Benjamin Moore, F.R.S., Mr. Sydney G. Paine, and others. He frequently found these and nothing else in whole series of his experimental tubes, and recognised them as such. But he did not find that these pseudo-organisms multiplied under the cover-glass or in nutrient media after the manner of bacteria and fungi. Moreover, I suggest that Mr. Onslow kept some of his "white solution" tubes far too long—three years in some cases—before finally opening them and examining their contents. Is it surprising, therefore, that no living organisms were found, but only dead ones? For bacteria in a non-nutrient medium cannot subsist and flourish indefinitely by living on one another.

On referring again to Mr. Onslow's detailed account of his experiments, as published in Proceedings of Royal Society (B., vol. xc., p. 266), I notice that his "yellow solution" was composed of dilute sodium silicate and pernitrate of iron *in addition to* the other ingredients as contained in the "white solution." This may very well account for his failure to confirm my father's results as described in "The Origin of Life." Professor Hewlett's results, to which Professor Halliburton also refers, if they did not go so far as to prove the truth of archebiosis, certainly do not disprove it, as he himself says in *Nature* of Jan. 22nd, 1914, p. 579. On the other hand, we have the testimony very largely in favour of my father's doctrines from M. Albert Mary, of Paris, in his letter published in your issue of June 28th.

I am, indeed, grateful for the great amount of time and trouble taken by the various observers who have been good enough to investigate these matters for themselves. In view of the importance of the subject, however, it is sincerely to be hoped that experiments on somewhat more extensive lines may now be carried out and that some of the funds from which we hope so much for scientific research may be devoted to this object, so all-important from many points of view, but particularly so from the point of view of medical science.—I am, Sir, yours faithfully,

W. BASTIAN,
Surgeon Commander, R.N.

Chesham Bois, Bucks, July 26th.

EDINBURGH UNIVERSITY ROLL OF HONOUR.

To the Editor of THE LANCET.

SIR,—It is proposed to publish a roll of honour and war record of the University of Edinburgh, and a letter asking for information as to war service, promotions, honours, &c., with dates, is being sent to all graduates and to the relatives of the fallen whose addresses are known. The number of medical graduates who have given their lives is large, and it has been found difficult to obtain the addresses of their relatives. Will those interested in the forthcoming publication communicate particulars to the undersigned?

I am, Sir, yours faithfully,

JOHN E. MACKENZIE, Major,
Editor of the Roll of Honour.

University of Edinburgh, July 15th, 1919.

THE REMUNERATION OF MEDICAL MEN SERVING ON PENSIONS BOARDS.

To the Editor of THE LANCET.

SIR,—In a recent issue of THE LANCET there was a letter stating that the Cheltenham practitioners had held a meeting and formulated the terms under which they were willing to serve on Pensions Boards. The majority of us now serving as members on Pensions Boards feel that the present fee of £1 1*s.* per session of two and a half hours and often longer is quite inadequate payment for the work done. The cases, especially those of suspected tuberculosis, require most careful examination and consideration. There is a feeling amongst us that a good deal of the clerical work of a non-medical character should be done by a clerk. Every few days more clerical work is thrust upon us, but the fees are not raised, although we now have to spend a good deal of extra time in each case. Many of us are demobilised from the R.A.M.C. and while on the look-out for permanent work we are trying to keep the wolf from the door by doing part-time work. The present remuneration is not enough to meet the increased cost of living.—I am, Sir, yours faithfully,

MEMBER OF THE BOARD.

July 28th, 1919.

ACUTE ŒDEMA OF THE FACE DUE TO POTASSIUM IODIDE.

To the Editor of THE LANCET.

SIR,—The occurrence of acute and marked œdema of the face, arising during a course of treatment by potassium iodide, is, I think, sufficiently rare to be of interest.

The patient, a man aged 65, consulted me on account of attacks of giddiness, from which he had been suffering lately, and he also gave a typical history of attacks of angina. His radial and temporal arteries were considerably thickened, cardiac dullness extended beyond the nipple line, the first

apical sound was prolonged and the second aortic sound accentuated. The urine contained neither albumin nor sugar. The patient was advised as to a limitation of diet, given a prescription for (1) some tabella trinitrini, and (2) pot. iod. gr. v., t.d.s. He returned five days later suffering from considerable œdema of both upper and lower eyelids and face. There was no œdema anywhere else in his body, nor was there a history of previous attacks of œdema or a family history of angioneurotic œdema. He also complained of frontal headache and sorethroat. It became necessary to discontinue the iodides, as even with increased doses the symptoms persisted.

Having failed to discover any other cause for this œdema, I believe it to have been due to the administration of the iodides, possibly aggravated by the simultaneous administration of nitrites.—I am, Sir, yours faithfully,

SIDNEY S. LINDSAY, L.R.C.P. Lond., M.R.C.S.

West End-lane, West Hampstead, July 8th, 1919.

ARMY SURGEONS AND THE F.R.C.S. EXAMINATION.

To the Editor of THE LANCET.

SIR,—Some time ago the Royal College of Surgeons of England announced that "surgeons who hold, or have held, commissions in H.M. Forces during the war and who have done commendable surgical work during such service, may be admitted to the First Examination for the diploma of Fellow on special conditions." It is unnecessary for me to repeat these conditions, as your readers must have seen them. They were also issued to units. Nevertheless I do not think anyone has drawn attention to the anomaly of the conditions or to the unfairness with which they operate. One would have thought that if facilities were to be given at all they would have been in respect of the subject in which special experience might have been gained when on service—viz., operative surgery. That would have been the only legitimate reason for creating short cuts to the F.R.C.S. Even then, the granting of these facilities to a few would not have been fair, because one cannot control one's postings and their resultant opportunities in the Army. The relief provided, however, refers to embryology and physiology—two subjects of which no one by his Army service can have possibly gained any experience. This makes the conditions still more unfair. I submit that if facilities are to be given—and those in respect of ancillary studies difficult for a service man to return to—all who joined voluntarily should be given them. It is quite bad enough that these higher examinations were held at all during the war, thus giving opportunities to the stay-at-homes, but it is worse to reward only some of those who freely and unsparingly gave themselves and jeopardised their prospects.

I am, Sir, yours faithfully,

July 25th, 1919. LATE R.A.M.C. AND INELIGIBLE.

THE PAY OF TERRITORIAL MEDICAL OFFICERS.

To the Editor of THE LANCET.

SIR,—I gather that the response of medical men to the War Office appeal for doctors has not been satisfactory. Perhaps the authorities have no idea how bitter still is the feeling among Territorial and Special Reserve medical officers at the difference in treatment recently meted out to them as compared with the temporary R.A.M.C. medical officer. Letters have appeared, representations made, but all to no purpose.

If the War Office were to supplement gratuities of all Territorial and S.R. medical officers (and so compensate them for the monetary loss they have suffered by being a Territorial or S.R. instead of a temporary R.A.M.C. officer), making their gratuities up to a total of, say, £500 for four years' embodied service (the same exactly as a naval medical officer is offered in peace-time after the same length of service, at which rate, too, a regular R.A.M.C. officer's gratuity after eight years' service is calculated), it would help to mitigate some of that soreness still so prevalent. The Territorial and S.R. medical officer is paid at the same rate as the regular: why, then, should not his gratuity be worked out at the same rate—namely, £125 a year for each year of embodied service, or 7*s.* a day pay? The temporary R.A.M.C. officer gets, after all, the equivalent of this in increased pay daily.—I am, Sir, yours faithfully,

CAPTAIN, R.A.M.C. (T.),

July 28th, 1919. late Surgeon, R.N.

Medical News.

GRANTS FOR MEDICAL EDUCATION.—We learn that certain London medical schools, which have prepared schemes for the reconstruction of their clinical teaching, have been officially informed that they can count upon financial assistance from the State based upon the approved expenditure incurred in carrying out those schemes.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination, held from July 1st to 17th, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas, viz:—

Medicine.—W. J. McB. Allan, Guy's; F. T. Allen, St. Thomas's; H. E. Archer, St. Bart.'s; S. T. Barrett, B.A. Cantab., Cambridge and Guy's; G. F. Baxter, Westminster; Grace Mary Beaven, L.M.S.S.A., St. George's; Julia Bell, Royal Free and St. Mary's; W. H. Bennett, L.R.C.P. & S. Edin., L.F.P. & S. Glasg., Manchester; P. C. Brett and J. D. M. Cardell, St. Thomas's; Marjorie Carnsew Chappel, Royal Free; B. H. Cole, Cambridge and St. Bart.'s; Alison Margaret Collie, St. Mary's; R. G. Dansie, King's College; Sarah Helen Davies, Royal Free; K. A. Denholm, Queen Univ., Canada; H. Donovan, Birmingham; T. Draper, Edinburgh; A. J. Fenn, King's College; P. C. C. Fenwick, L.M.S.S.A., St. Thomas's; I. Frost, St. Bart.'s; A. E. Gravelle, L.M.S.S.A., King's College; E. C. Grey, D.Sc. Lond., F.I.C., Guy's; H. M. Guggenheim, M.D. Paris, Paris; H. W. Hardy, L.D.S. Eng., Charing Cross; E. P. Hicks, Cambridge and St. Bart.'s; T. R. E. Hillier, Middlesex; Mabel Marian Ingram, Royal Free and London; C. A. Kirton, University College; J. V. Landau, St. Bart.'s; F. G. Lewtas, Cambridge and St. George's; R. T. McRae, London; Margaret Ombler Meek, Cambridge and Charing Cross; G. E. Morgan, Oxford and London; W. P. Newman and C. Nicory, St. Thomas's; Sibyl Gertrude Overton, St. Mary's; G. Packham, L.D.S. Eng., and W. W. Payne, Guy's; J. Posner, Dublin; Eleanor Margaret Reece, Royal Free; H. N. Schapiro, Guy's; Ruth Mary Scutt, St. Mary's; J. T. Short, M.D. Penn., Pennsylvania; J. V. A. Simpson, Middlesex; W. A. M. Smart, B.Sc. Lond., London; H. E. Smith, Sheffield; G. M. Trist, Charing Cross; W. A. Turner, Guy's; G. van Acker, Oxford and Birmingham; A. D. Weeden, Middlesex; Effie Adeli Wharton, St. George's; J. S. White, St. Bart.'s; Octavia Margaret Wilberforce, Royal Free and St. Mary's; Kathleen Mary Wilkinson and Margaret Aileen Williams, Birmingham; T. Williams, Middlesex; W. R. Williams, Liverpool; C. Young, Middlesex; and T. F. Zerolo, St. Bart.'s.

Midwifery.—F. F. Abdullah, St. Mary's; W. G. Barnard, London; H. Boger, University College; T. L. Bonar, St. George's; J. Bonfield, M.B. Kingston, Queen's Univ., Ont.; C. H. Bulcock, St. Bart.'s; G. F. Burnell, Charing Cross; J. W. Chadwick, Manchester; F. Christian, University College; O. T. J. C. de H. Clayre, St. Bart.'s; G. L. Clements, Birmingham; H. Cohen, Westminster; M. Cohen, Guy's; J. C. Copp, M.B. Tor., Toronto; F. C. Cozens, Cambridge and St. Bart.'s; A. R. Crane, London; J. J. da Gama Machado, St. Bart.'s; R. W. M. Dendy, Cambridge and St. George's; K. A. Denholm, M.D. Queen's Univ., Kingston; C. J. C. de Silva, Middlesex; T. Draper, Edinburgh; D. G. Garnett, Cambridge and St. Thomas's; W. Girgis, St. Mary's; A. E. Gravelle, L.M.S.S.A., King's College; E. C. Grey, D.Sc. Lond., F.I.C., Guy's; F. B. Hobbs, Cambridge and St. Thomas's; F. James, Charing Cross; O. E. Kennedy, M.B. Queen's Univ., Kingston; J. V. Landau, St. Bart.'s; F. F. Langridge, London; T. J. Lesser, Royal Free; H. T. Le Vieux, Guy's; F. C. Lewis, Liverpool; P. T. Liang, Cambridge and St. Thomas's; W. A. Low, St. Thomas's; P. T. McIlroy, M.B. Queen's Univ., Kingston; S. F. Mahmod, St. Bart.'s; C. G. Martin, Cambridge and St. Bart.'s; D. J. Millar, M.B. Queen's Univ., Kingston; L. Moss, Guy's; G. G. Newman, London; Olga Grace Mary Payne, M.Sc., M.B., Ch.B. Manch., Manchester; N. A. M. Petersen, London; J. A. M. Ross, St. Bart.'s; M. Sawhney, Cambridge and Middlesex; J. T. Short, M.D. Penn., Pennsylvania; C. J. Slim, Birmingham; W. A. M. Smart, B.Sc. Lond., London; F. D. Spencer, Birmingham; B. W. Thompson, St. Bart.'s; B. M. Tonkin, Guy's; D. L. Tucker, Cambridge and Edinburgh; W. G. D. H. Urwick, St. Bart.'s; G. v. L. van Acker, Oxford and Birmingham; N. V. Wadsworth, Guy's; Mary Howarth Wild, M.B., Ch.B. Liverp., Liverpool; Kathleen Mary Wilkinson and Margaret Aileen Williams, Birmingham; W. R. Williams, Liverpool; Grace Elizabeth Winn, Royal Free and St. Mary's; Jane Edith Wood, Leeds; C. Woode, Charing Cross; and F. B. Yonge, L.D.S. Eng., Middlesex.

Surgery.—C. M. Billington, Cambridge and St. Thomas's; M. R. Boe, M.D., C.M., Queen's Univ., Kingston; H. Brockman, Middlesex; G. P. Evans, St. Mary's; L. P. Garrod and N. J. Macdonald, Cambridge and St. Bart.'s; T. Menzies-Annan, Cambridge and King's College; Sibyl Gertrude Overton, St. Mary's; Olga Grace Mary Payne, Manchester; H. W. Pigeon, M.D., C.M. McGill, McGill; R. E. R. Sanderson, Cambridge and St. Bart.'s; R. R. Sarra, Cambridge and London; Ruth Mary Scutt, St. Mary's; S. D. Sturton, Cambridge and St. Bart.'s; W. S. R. Thomas, Cambridge and Guy's; R. Thurgar, King's College; D. L. Tucker, Cambridge and Edinburgh; Kathleen Suzanne Vine, L.M.S.S.A., Royal Free; W. Walaham, St. Mary's; and M. L. Young, Cambridge and St. Thomas's.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on July 24th, Sir Henry Makins, the President, being in the chair.—The President reported that H.R.H., the Prince of Wales had consented to become an Honorary Fellow of the College. The votes of the Council were taken in accordance with the requirements of the Charter of 1899, and the President declared His Royal Highness to be duly and unanimously elected an Honorary Fellow. The President stated that

the Prince of Wales hoped on his return from Canada towards the end of the year to attend at the College to receive his diploma. The President reported that H.R.H. the Duke of Connaught (Colonel-in-Chief of the R.A.M.C.), had also consented to become an Honorary Fellow of the College. Whereupon the votes of the Council were taken and His Royal Highness was duly and unanimously elected an Honorary Fellow. The Secretary laid before the Council a balance sheet dated June 24th, and a statement of the receipts and expenditure of the College for the year ending on that date, with the certificates of the auditors attached thereto, together with a list of the investments, showing their value on that date. The balance sheet and the statements as to receipts and expenditure were approved and adopted, and it was resolved to publish them in the College calendar and in the annual report of the Council to the Fellows and Members. It was decided that the annual meeting of the Fellows and Members should be held on Thursday, Nov. 27th, at 3 P.M.

UNIVERSITY OF LONDON.—At examinations for internal and external students held recently the following candidates were successful:—

M.D. EXAMINATION.

Branch I., Medicine.—Frank Cyril Harvie Bennett, B.S., St. Mary's Hosp.; Dorah Challis Colebrook, B.S., London School of Medicine for Women; Clement Cooke, B.S., St. Bartholomew's Hosp.; Annie Mary Forster, B.S., London School of Medicine for Women; George Edward Genge-Andrews, B.S., Guy's Hosp.; *Mary Esther Harding, B.S., London School of Medicine for Women; John Stephen Herbert Lewis, B.S., University College Hosp.; Harold Arundel Moody, B.S., King's College Hosp.; and John Alfred Ryle, B.S. (University medal), Guy's Hosp.

Branch II., Pathology.—Graham Selby Wilson, B.S., Charing Cross Hosp.

Branch III., Mental Diseases.—Millais Culpin, B.S., London Hosp.; Charles Wesley Forsyth, Victoria University of Manchester and University College Hosp.; and Thomas Chivers Graves, B.S., B.Sc. (Vet. Sci.), University College Hosp.

Branch IV., Midwifery and Diseases of Women.—Joseph Anthony Ferrière, B.S., University College; Jerusha Jacob Jhirad, B.S., London School of Medicine for Women; Martin Herbert Oldershaw, B.S., and Victor Jorge E. C. del S. Perez y Marzan, B.S., University College Hosp.; and Cecil George Richardson, B.S., Westminster Hosp.

* Obtained the number of marks qualifying for the University medal.

M.S. EXAMINATION.

Branch I., Surgery.—William Bashall Gabriel and Leonard George Phillips, B.Sc., Middlesex Hosp.

N.B.—This list, published for the convenience of candidates, is issued subject to its approval by the Senate.

UNIVERSITY OF OXFORD.—At examinations held recently for the Diploma in Ophthalmology the following satisfied the examiners:—

Herbert William Archer-Hall, Ernest Milne Eaton, Vernon O'Hea Cussen, Walter Herman Kiep, and William Clark Souter.

UNIVERSITY OF SHEFFIELD.—At examinations held recently the following candidates were successful:—

M.B., CH.B. DEGREES.

Final Examination.—William Collins, Raymond E. Ford, Robert H. Greaves, Dorothy K. Mathews, Reginald E. Pleasance, Frederick Roper, Lazarus Samuels, Frederick L. Smith, and Alice White.

Third Examination.—May T. Bassett, Constance M. Chappell, and Raymond E. Ford.

Second Examination.—Edgar S. Clayton, Robert Platt, and Elsa F. Paige.

First Examination.—George R. Bailey, Oswald H. Billington, Clifford S. Dunbar, Camille Francotte, Rene Francotte, John E. Tannian, William H. Harding (with distinction in Physics), Sidney G. Meanley, James E. Schofield, and Francis A. Wrench.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following are the results for the examination held at the end of the sixtieth session (May–July, 1919):—

*W. H. W. Cheyne (Duncan and Lalcaca medals), *J. I. Connor, *G. S. Glass, *R. D. FitzGerald (Straits Settlements Medical Service), *Surg. Lieut.-Cmdr. T. C. Patterson, R.N., Capt. W. C. Spackman, I.M.S., P. A. Dalal, A. C. Price, Capt. H. N. Stafford, R.A.M.C., J. T. Smeall, Miss Y. H. Hoashoo, Miss S. A. Finch, Miss A. Bramsen, N. B. Watch, H. C. Gilmore, S. Foskett, J. W. Scharff, J. P. Tibbles, Miss E. Warren, B. Mountain, B. B. Jareja, C. Farrell, A. R. Neckles, and J. A. Liley.

* With distinction.

CENTRAL MIDWIVES BOARD.—A meeting of the Central Midwives Board was held at Queen Anne's Gate Buildings, Westminster, on July 24th, with Sir Francis H. Champneys in the chair. A letter was considered from the medical officer of health for Winchester, inquiring (*a*) whether the rules of the Board deal with the question of practice by a midwife supposed to be a chronic carrier of disease; (*b*) whether such a woman, if suspended from practice in order to prevent the spread of infection, would be entitled to compensation from the Board, or from the local supervising authority which has suspended her. The Board directed that the replies be (*a*) that the question of practice by a midwife liable to be a source of infection is dealt with in Rule E. 6; (*b*) that by Section 6 (2) of the Midwives Act, 1918, where "a midwife has been suspended from practice in order to prevent the spread of infection the Board, or the local supervising authority by whom she was suspended, may, if they think fit, pay her such reasonable compensation for loss of practice as under the circumstances may seem just."—The secretary tendered his resignation, which was received by the Board with much regret, and it was decided that, subject to the approval of the Ministry of Health, Mr. Herbert George Westley, M.A., LL.B. Cantab., be appointed secretary.

A special meeting was held on the same day when four midwives were struck off the Roll, the following charges, amongst others, having been brought forward:—

A child suffering from inflammation and discharge from the eyes the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E. 21 (5). Medical aid having been sought for a child the midwife neglected to notify the local supervising authority thereof, as required by Rule E. 22 (1) (a). The midwife not being scrupulously clean in every way, as required by Rule E. 2; when attending patients she did not wear a clean dress of washable material that can be boiled, as required by Rule E. 2, and when called to a confinement she did not take with her the appliances required by Rule E. 3. The midwife did not take and record the pulse and temperature of her patients at each visit, as required by Rule E.14; she did not enter her records of pulse and temperature in a notebook or on a chart carefully preserved, as required by Rule E.14, and she did not keep her register of cases as required by Rule E.24. When called to a confinement the midwife neglected to take with her in a metal case or bag or basket, kept for that purpose only and furnished with a removable lining which can be disinfected, the appliances and antiseptics required by Rule E.3; she neglected to disinfect her hands and forearms before touching the generative organs or their neighbourhood, as required by Rule E.4; she neglected to wash the patient's external parts with soap and water and to swab them with an efficient antiseptic solution, as required by Rule E.8; she neglected to remove soiled linen, placenta, and membranes from the patient's neighbourhood and from the lying-in room before leaving the patient's house, as required by Rule E.11, and she neglected to give the necessary directions for securing the cleanliness, comfort, and proper dieting of the mother and child during the lying-in period, as required by Rule E.12. Medical aid having been sought for a patient the midwife neglected to notify the local supervising authority thereof, as required by Rule E.22 (1) (a). A child suffering from imperforate urethra the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rule E.21 (5). A patient suffering from rigor with raised temperature, and on subsequent days from other illness, the midwife did not explain that the case was one in which the attendance of a registered medical practitioner was required, as provided by Rules E.20 and 21 (4). A patient suffering from puerperal fever, and the midwife being herself liable to be a source of infection, she neglected to notify the local supervising authority, as required by Rule E 6.

Lieutenant-Colonel J. F. Donegan, R.A.M.C., has been awarded the honorary degree of LL.D. by the National University of Ireland.

Dr. H. Beecher Jackson has been appointed coroner for Croydon.

SEATON V.A. HOSPITAL.—This hospital, which was recently closed, was one of the two most economically worked in Devonshire. There was a balance in hand of £1088. £161 were given to the Royal Devon and Exeter Hospital and the balance divided amongst the parishes which had subscribed to the hospital.

LONDON HOSPITAL MEDICAL COLLEGE.—A course of clinical lectures for advanced students on "Intermittent Blood Infections and their Relation to Certain Common Diseases of the Kidney, Prostate, Testicle, and other Organs" will be delivered by Mr. Frank Kidd, surgeon in charge of the Genito-Urinary Department, in the Clinical Theatre of the Hospital, on four successive Wednesdays beginning August 6th, at 4.15 P.M. A special course of instruction in the surgical dyspepsias is being repeated on Mondays and Fridays, commencing on August 1st, by Mr. A. J. Walton, assistant surgeon to the hospital. The lectures will be continued till Oct. 27th. Members of the medical profession will be admitted to all these lectures on presentation of their cards.

LONDON HOSPITAL: AWARD OF PRIZES.—At a recent meeting of the College Board of the London Hospital the following prizes were presented:—"Price" and entrance scholarships in Science, (1) £100, (2) £50, Messrs. G. N. Golden, J. A. H. Andre, K. W. Todd (equal, scholarships divided); Epsom scholarship (for students of Epsom College), Mr. G. L. Peskett; prize in Clinical Medicine (£20), Mr. A. B. K. Watkins; prize in Clinical Surgery (£20), Messrs. E. L. Sergeant and A. B. K. Watkins (equal, prize divided); prize in Clinical Obstetrics and Gynæcology (£20), Mr. M. W. B. Bulman; "Duckworth Nelson" prize in Practical Medicine and Surgery (£10), Mr. A. B. K. Watkins; "Letheby" prizes in Elementary Clinical Surgery, Messrs. J. E. Zeitlin, F. H. W. Tozer, and Miss O. G. Potter; "Anderson" prizes in Elementary Clinical Medicine, Miss M. E. Kennedy, Miss D. W. Roughton, Mr. D. C. Williams.

POST-GRADUATE MEDICAL TEACHING IN GLASGOW.—Under the joint auspices of the Faculty of Medicine, Glasgow University, and the General Committee for Post-Graduate Medical Teaching in Glasgow a successful emergency course of post-graduate medical study in various institutions in Glasgow has just drawn to a conclusion. The course was arranged to meet the needs of graduates who had been on Service and were returning to take up civilian duties. The facilities offered were taken advantage of by doctors from places as far away as America and China, India and the West Indies, and Basutuland, and while the majority of the graduates who attended the course were officers or ex-officers of the Navy or Army a few local practitioners also availed themselves of the opportunities offered. A further course has been arranged to be held during September and October in Glasgow, and this is to be essentially a practitioners' course. The classes will be clinical and practical, and specially designed to meet the needs of those who have been on Service and are entering or re-entering general practice. In addition to the usual classes in medicine, surgery, and obstetrics a special course on tuberculosis has been arranged at the Consumption Sanatoria, Bridge of Weir, and at the tuberculosis dispensary in Glasgow. In gynæcology and obstetrics exceptional opportunities are available. Special evening demonstrations have been arranged in diseases of the throat, nose, and ear. The syllabus may be obtained from the acting secretary, Dr. A. M. Kennedy, Pathological Institute, Royal Infirmary, Glasgow.

SOCIÉTÉ DE BIOLOGIE, PARIS.—Two recent meetings of this society—June 14th and 21st—were devoted to a consideration of the physiology and pathology of aviation. Among the 16 papers read were the following:—

Ferry, A.—Flying Sickness and its Sequelæ.

Elles permettent: 1° De rapprocher des manifestations azotém'ques et mrémigènes de la sclérose rénale, de certains troubles accusés par les aviateurs. 2° De rattacher ces troubles de l'influence surrénale. A, Influence du repos sur la tension sanguine de l'aviateur: il supprime l'hypertension de l'intervalle des vols, réduit l'hypertension consécutive au vol. B, Signes prémonitoires de l'asthénie des aviateurs. C, Rechercher surtout le dédoublement très précoce du 2e bruit, à l'examen du cœur.

Guillain, G., et Ambard, L.—Reaction-time and Flying Aptitude.

La détermination des temps de réaction élémentaire chez les candidats à l'aviation est utile au point de vue documentaire; mais qu'il ne faut en tirer que des conclusions très prudentes.

Tara.—Blood Pressure Measurements.

Les mesures ont abouti aux résultats suivants: 1° Au fur et à mesure que l'altitude croit, les chiffres des maxima et minima baissent, mais pas aussi vite que la pression atmosphérique. 2° Après grands vols aux hautes altitudes il persiste de l'hypotension surtout aux maxima.

Josue, M. O.—The Airman's Asthenia.

En général la pression maxima est basse. La pression minima est normale. Après repos la pression revient à la normale. Quand on a une maxima très basse et qui se maintient telle, il y a lieu de redouter l'apparition de l'asthénie des aviateurs.

C'est une variété particulière d'insuffisance surrénale. Les signes sont: 1° Asthénie avec perte de la maîtrise de soi, tendance syncopale, quelquefois phénomènes neurasthéniques. 2° Hypotension artérielle portant sur la maxima, quelquefois sur la minima. 3° Ligne blanche surrénale de Sergent. Durée: un mois 1/2 à 3 mois et plus. Traitement: repos absolu et l'opothérapie surrénale.

The Services.

THE HONOURS LIST.

The following awards to medical officers are announced:—

Bar to Military Cross.—Capt. F. G. Flood, M.C., R.A.M.C. (Spec. Res.). During operations at Vigozero and Petrovski Yam on March 18th, 1919, he dressed wounded under heavy machine-gun and rifle fire, and under most trying conditions saved many lives. After the action he successfully evacuated all the wounded over 60 versts of most difficult country without losing a case. He showed great gallantry and marked ability and devotion to duty.

C.B.E.—Surg. Cdr. R. J. MacKeown, R.N., Surg. Cdr. H. B. Marriott, R.N., Surg. Lt.-Cdr. E. A. G. Wilkinson, R.N., for valuable services in the First Battle Squadron.

Foreign Decorations.

Légion d'Honneur (French).—Officier: Maj.-Gen. M. W. O'Keefe, K.C.M.G., C.B. Chevalier: Temp. Capt. (acting Maj.) L. D. Woods, R.A.M.C.; Temp. Capt. M. S. Bryce, M.C., R.A.M.C. *Croix de Guerre:* Maj.-Gen. H. N. Thompson, C.B., C.M.G., D.S.O.; Temp. Capt. P. B. Belanger, M.C., R.A.M.C.; Maj. J. M. Bowie, R.A.M.C.; Temp. Capt. (acting Maj.) D. Cowin, R.A.M.C.; Temp. Capt. (acting Maj.) A. R. Green, R.A.M.C; Temp. Capt. A. A. Greenwood, R.A.M.C.; Capt. (acting Lt.-Col.) H. A. Harbison, M.C., R.A.M.C.; Temp. Capt. (acting Maj.) E. E. Herga, M.C., R.A.M.C.; Maj. (temp. Col.) T. Kay, D.S.O., R.A.M.C.; Maj. B. E. Kelly, Canadian A.M.C.; Temp. Capt. H. Neame, R.A.M.C.; Capt. C. L. Franklin, M.C., R.A.M.C.; Capt. (acting Maj.) N. V. Lothian, M.C., R.A.M.C. *Palmes Académiques:* Maj. (temp. Lt.-Col.) W. D. C. Kelly, D.S.O., R.A.M.C.; Temp. Capt. (acting Maj.) T. C. Ritchie, O.B.E., R.A.M.C.; Temp. Capt. H. T. Retallack-Moloney, R.A.M.C. *Ordre de l'Etoile Noire:* Maj. (acting Lt. Col.) T. B. Moriarty, D.S.O., R.A.M.C.

Order of the Redeemer (Hellenes).—Chevalier: Temp. Capt. J. Watson R.A.M.C. *Order of George I.*—Officer: Surg.-Cdr. E. C. Sawdy, R.N.

Military Order of Avis (Portuguese).—Grand officer: Maj.-Gen. H. Carr, C.B., A.M.S.; Maj.-Gen. R. H. S. Sawyer, C.B., C.M.G. (ret pay), late A.M.S. Commander: Maj. (temp. Lt.-Col.) G. N. Biggs, R.A.M.C.; Lt.-Col. (temp. Col.) J. H. Campbell, D.S.O., R.A.M.C.; Col. H. R. Cree (ret. pay), late A.M.S; Brev.-Col. W. L'E. Eames, C.B., R.A.M.C.; Col. J. M. Elder, C.M.G., Canadian A.M.C.; Lt.-Col. J. R. Harper, R.A.M.C.; Col. E. M. Hassard, A.M.S.; Col. R. H. Penton, D.S.O., A.M.S.; Lt.-Col. S. J. C. P. Perry, R.A.M.C.; Lt.-Col. (acting Col.) W. L. Steele, C.M.G., R.A.M.C.; Col. H. S. Thurston, C.B., C.M.G., R.A.M.C.; Col. A. H. Waring, D.S.O., R.A.M.C.; Maj. M. C. Wethered, R.A.M.C. Cavaleiro: Temp. Capt. M. du B. Ferguson, R.A.M.C.; Capt. (acting Maj.) A. D. Stirling, D.S.O., R.A.M.C.; Maj. J. L. Wood, R.A.M.C.

Distinguished Service Medal (American).—Maj.-Gen. (temp. Lt.-Gen.) Sir C. H. Burtchaell, K.C.B., C.M.G., K.H.S.; Lt.-Gen. Sir T. H. J. C. Goodwin, K.C.B., C.M.G., D.S.O., K.H.S.

Croix de Guerre (Belgian).—Capt. D. L. Stevenson, M.B.E.

Mentioned in Despatches.

In a despatch received from the Commander-in-Chief in India the names of the following medical officers and others are mentioned: Maj. F. A. H. Clarke, R.A.M.C.; Capt. F. G. Cross, R.A.M.C.; Maj. A. L. Davies, Hon. Supt., Red Cross Dep., Bombay; Maj. (temp. Lt.-Col.) P. Dwyer, M.C., R.A.M.C.; Maj. W. F. Harvey, I.M.S., Director, Central Research Institute, Kasauli; Maj.-Gen. P. Hehir, C.B., C.M.G., C.I.E., I.M.S.; Lt.-Col. K. V. Kukday, I.M.S.; Dr. S. K. Mullick, C.B.E., Calcutta; Lt.-Gen. Sir T. J. O'Donnell, K.C.I.E., C.B., D.S.O., A.M.S., D.M.S. in India; Dr. S. P. Sarbadhikari, C.I.E., Calcutta; Capt. A. G. Tressider, I.M.S.; Maj. G. S. Wallace, R.A.M.C.; Lt.-Col. H. E. Winter, R.A.M.C.

Brought to Notice.

The names of Surg.-Lt. E. St. G. S. Goodwin, R.N., and of Surg.-Lt. L. Moss, R.N., have been brought to the notice of the Admiralty for valuable services in the prosecution of the war.

ROYAL NAVAL MEDICAL SERVICE.

Temp. Surg. Lieut. K. McFadyean, who has been invalided on account of ill-health contracted in the Service, to retain his rank.

To be Surgeon Lieutenants: R. P. Ninnis, E. Hefferman.

Temp. Surg. Lieut. R. A. Brown is transferred to Permanent List of Surgeon Lieutenants.

ROYAL NAVAL VOLUNTEER RESERVE.

To be temporary Surgeon Lieutenant: E. L. Adendorff.

ARMY MEDICAL SERVICE.

Col. (temp. Maj.-Gen.) Sir Samuel Hickson, K.B.E., C.B., is granted the honorary rank of Major-General on ceasing to be employed.

Col. Albert L. F. Bate, C.M.G., retires on retired pay.

Col. W. H. Grattan, C.B.E., D.S.O., to be Deputy Director of Hygiene at the War Office.

Temp. Col. Sir T. Myles, C.B., relinquishes his commission and retains the rank of Colonel.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. J. C. Jameson retires on retired pay.

Major H. W. Farebrother relinquishes the acting rank of Lieutenant-Colonel on re-posting.

The undermentioned relinquish the acting rank of Major: Capt. and Brevet Major F. C. Cowtan; Capts. C. Russell, R. A. Hepple, E. B. Marsh, R. Ellis, A. P. O'Connor, N. Cantlie, F. R. H. Mollan; Temp. Capts. C. A. R. McCay, W. C. Douglass, T. Bragg, H. B. Doy, J. S. Doyle, A. P. Saint, J. W. Tocher, J. G. Ackland, A. W. D. Coventon, J. R. Collins, G. Rankine, B. W. Armstrong, H. F. Warwick, A. Leyland Robinson, C. A. Weller, J. R. G. Calverley, A. Poole, T. Kelly, E. G. D. Pineo, A. Felling.

To be acting Majors: Capt. A. L. Stevenson; Temp. Capts. J. Buchanan, W. D. Cruickshank, A. Mathieson, A. K. H. Pollock, D. Cowin, J. V. Grant, T. V. Somerville, E. G. D. Pineo, A. H. Macklin.

Capt. F. W. M. Cunningham retires, receiving a gratuity.

Capts. St. J. D. Buxton and H. A. Harbison resign their commissions.

To be Captains: Capts. F. K. Tomlinson (from T.F.), H. S. Griffith (from Spec. Res.), R. O'Kelly (from Spec. Res.), T. Young (from Spec. Res).

To be Temporary Captains: C. L. G. Powell, L. A. J. Graham, W. G. D. McCall, J. M. Ryan.

Captains from Special Reserve to be Lieutenants and to be temporary Captains: D. R. Hennessy, T. Parr, J. D'Arcy Champney, J. W. Hyatt.

Temp. Capt. J. K. Holland to be Lieutenant and to be temporary Captain.

Temp. Lieut. T. C. Hughes to be temporary Captain.

Officers relinquishing their commissions: Temp. Lieut.-Col. G. B. Price (retains the rank of Lieutenant-Colonel). Temp. Hon. Lieut-Col. W. J. Richard (retains the honorary rank of Lieutenant-Colonel).

The notification of the relinquishment of the acting rank of Lieutenant-Colonel by Major P. T. C. Davy is cancelled. Temporary Majors retaining the rank of Major: C. D. O. Grange, H. Irving, E. R. Fothergill. Temporary Captains granted the rank of Major: W. K. McIntyre, A. T. Todd, F. J. O. King, A. C. Renton, W. H. Bryce, J. H. Legge, R. R. Wallace, T. W. Buckley, R. Millar, J. B. Alexander, G. Rankine, T. Bragg, S. Brown. Temporary Captains retaining rank of Captain: W. A. Wilson-Smith, A. J. D. Cameron, R. Vincent, E. A. O. Travers, O. A. Beaumont, G. C. Wells-Cole, G. H. Urquhart, P. A. Serjeant, W. A. Wheeldon, A. Brownlie, D. Kelly, J. Stephenson, J. M. Biggs, M. A. C. Buckell, J. A. Dickson, T. L. Fleming, E. T. C. Hughes, G. F. Rigden, J. D. Lyle, A. V. Craig, O. J. W. Adamson, F. H. Mosse, J. C. Neil, W. F. Hare, W. P. Philip, P. B. Belanger, M.C. R. Grahame, J. F. C. O'Meara, W. H. Gibson, R. G. Gordon, R. M. Paterson, V. G. Ward, J. Cross, J. G. Lee, P. W. L. Andrew, N. J. Newbould, S. W. Fisk, H. S. Metcalfe, G. W. Pope, W. H. Duncan, P. G. Leeman, P. Ashe, E. O. Marks, C. Garner, C. R. Young, G. Macdonald, A. N. Fell, R. S. Johnson, F. H. Young, H. L. Burton, J. Ross, L. L. Cassidy, A. Vella, T. A. Davidson, F. R. Dougan, H. T. Retallack-Moloney, T. C. Harte, J. A. H. Telfer, O. R. M. Kelly, C. I. Ilderton, F. V. Hanratty, C. H. G. Gostwyck, R. Lewis, J. F. Venables, T. S. Reeves, H. J. Rawson, J. D. C. Swan, G. E. Charters, J. M. Richey, S. H. Kingston, I. D. Ramsay, H. C. Wert,

M. Gross, J. A. Wood (late temp. Capt., is granted the rank of Captain); Temp. Hon. Capt. D. E. Carter (retains the hon. rank of Captain); Temp. Lieuts. C. M. Halsall, W. Hickey, W. E. Thompson, W. Napier, J. B. G. Calverley, E. B. Bate, F. Aitken (retain the rank of Lieutenant).

Canadian Army Medical Corps.

Temp. Lieut.-Col. (acting Col.) K. St. J. MacDonald relinquishes the acting rank of Colonel.

The undermentioned temporary Majors (acting Lieutenant-Colonels) relinquish the acting rank of Lieutenant-Colonel: S. L. Walker, W. H. Lowry.

The undermentioned temporary Captains (acting Majors) to be temporary Majors: J. H. Slayter, C. T. Wallbridge, C. A. Davies.

Temporary Captains (acting Majors) relinquishing the acting rank of Major: C. B. Kidd, H. B. Van Wyck, R. F. Slater, A. Sterling, H. G. Murray, G. S. Murray, G. S. Gordon, E. P. Lewis, L. F. Jones, D. G. K. Turnbull.

The undermentioned temporary Lieutenants to be temporary Captains: J. E. Wadsworth, M. A. Wittick.

The undermentioned retire in the British Isles: Temp. Major G. J. Gillam; Hon. Major F. Lessore; Temp. Capts. D. G. K. Turnbull, G. J. Preston, A. B. Roberts, R. H. Fisher, R. D. Cowan, A. Keay, G. More; Hon. Capt. F. White.

Canadian Army Dental Corps.

Temp. Major (acting Lieut.-Col.) B. L. Nelley to be temporary Lieutenant-Colonel.

The undermentioned retire in the British Isles: Temp. Major L. N. Trudeau; Temp. Capt. W. Kennedy.

GENERAL RESERVE OF OFFICERS.

H. A. Harbison and S. J. D. Buxton, late Captains, R.A.M.C., to be Captains.

SPECIAL RESERVE OF OFFICERS.

Captains relinquishing the acting rank of Major: H. T. Chatfield, J. W. Malcolm, T. F. Corkill, F. Cook, J. W. Cannon.

Capt. F. G. Flood, M.C., to be acting Major.

Lieutenants to be Captains: B. G. Derry, J. C. McGregor, J. K. T. Mills.

TERRITORIAL FORCE.

Lieut.-Col. (acting Col.) J. Mackinnon, D.S.O., relinquishes the acting rank of Colonel on ceasing to be specially employed.

Major R. B. Purves to be acting Lieutenant-Colonel whilst specially employed.

Capts. (acting Lieut.-Col.) J. Bruce to be Major, and to retain the acting rank of Lieutenant-Colonel.

Captains (acting Lieutenant-Colonels) relinquishing the acting rank of Lieutenant-Colonel on ceasing to be specially employed: P. Moxey, W. B. Keith, T. H. Richmond, T. A. Green.

Captains (acting Majors) relinquishing the acting rank of Major on ceasing to be specially employed: T. C. Britton, A. C. Tibbits, H. Foxton, D. R. Kilpatrick, H. J. Blackler, T. G. Buchanan, G. B. Buchanan.

Capt. (acting Major) A. Leggat relinquishes the acting rank of Major on vacating the appointment as Deputy Assistant Director of Medical Services.

Capt. M. S. Doubble to be a Deputy Assistant Director of Medical Services, and to be acting Major whilst so employed.

Captains to be acting Majors whilst specially employed: M. Brannan, J. P. Milton, G. Davidson, J. Muir, A. W. Paterson.

2nd Scottish General Hospital: Capt. (acting Major) A. A. S. Skirving relinquishes the acting rank of Major on ceasing to be specially employed.

1st Southern General Hospital: Lieut.-Col. F. W. Ellis is seconded for duty with the 2/1st Southern General Hospital.

2nd Southern General Hospital: Major (Bt. Lieut.-Col.) (acting Lieut.-Col.) A. B. Prowse and Major J. Swain to be Lieutenant-Colonels. Majors (acting Lieut.-Cols.) G. Parker and R. G. P. Lansdown relinquish the acting rank of Lieutenant-Colonel on ceasing to be specially employed. Capt. (acting Major) J. L. Firth relinquishes the acting rank of Major on ceasing to be specially employed.

3rd Southern General Hospital: Capt. N. B. Clowes is restored to the establishment.

4th London General Hospital: Major (acting Lieut.-Col.) W. G. Spencer relinquishes the acting rank of Lieutenant-Colonel on ceasing to be specially employed. Capt. (acting Major) C. Gibbs relinquishes the acting rank of Major on ceasing to be specially employed. Capt. W. Turner to be acting Major whilst specially employed.

1st Northern General Hospital: Major T. M. Allison is restored to the establishment.

1st Western General Hospital: Major (acting Lieut.-Col.) R. W. Murray relinquishes the acting rank of Lieutenant-Colonel on ceasing to be specially employed.

1st London Sanitary Company: Lieut. R. Wood to be Captain.

2nd London Sanitary Company: Lieut. S. G. Reed to be Captain.

ROYAL AIR FORCE.

Medical Branch.—Major E. M. W. Hearn (Staff Surgeon, R.N.) relinquishes his commission on ceasing to be employed.

Capt. R. L. Roe to be acting Major whilst employed as Major.

T. C. Backhouse (Captain, A.A.M.C.) is granted a temporary commission as Captain.

The undermentioned are transferred to unemployed list: Major H. Pritchard; Capts. N. R. Williamson, I. L. Waddell; Lieuts. L. C. Broughton-Head, C. H. Vernon, P. E. Williams.

Dental Branch.—Lieut. P. J. Proud is transferred to unemployed list.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

METEOROLOGICAL OFFICE: ADVISORY COMMITTEE ON ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

June 30th, 1918.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	32	0·04	0·97	1·66	0·76	1·67	5·10	0·57	0·40	0·06
Embankment Gardens	18	0·04	0·76	0·58	1·80	3·68	6·86	1·60	0·51	0·08
Finsbury Park ...	31	0·03	0·56	3·11	0·78	1·85	6·32	0·80	0·20	0·06
Ravenscourt Park	25	0·02	0·69	1·80	1·02	1·93	5·45	0·86	0·59	0·11
Southwark Park	14	0·05	1·01	3·25	1·51	3·11	8·93	1·60	0·38	0·07
Victoria Park* ...	—	—	—	—	—	—	—	—	—	—
Wandsworth Com.	12	0·02	0·44	1·18	0·72	1·56	3·85	0·57	0·24	0·03
Golden Lane ...	26	0·05	1·58	2·22	1·12	2·35	7·33	1·18	0·69	0·15
Malvern*	—	—	—	—	—	—	—	—	—	—
Manchester—										
Whitworth Street (garden)	41	—	—	—	—	—	12·50	—	—	—
,, (roof of College)*	—	—	—	—	—	—	—	—	—	—
Newcastle-on-Tyne	14	0·11	1·12	2·43	0·97	1·92	6·55	0·94	0·26	0·02
Rochdale	—	—	—	—	—	—	34·80	—	—	—
St. Helens	56	0·23	3·52	9·82	2·92	4·58	21·08	2·50	1·28	0·36
Southport—										
Hesketh Park ...	43	0·01	0·22	0·32	0·63	3·46	4·64	1·32	0·51	0·03
Woodvale Moss...	35	—	—	—	—	—	4·36	—	—	—
SCOTLAND.										
Coatbridge	31	0·10	1·45	5·43	1·22	3·18	11·38	1·71	0·19	0·14
Glasgow—										
Alexandra Park...	18	0·24	1·04	2·95	0·80	1·80	6·83	0·76	0·06	0·03
Bellahouston Park	27	0·23	1·29	4·18	0·56	2·42	8·68	1·09	0·14	0·04
Blythswood-sq. ...	26	0·16	1·09	2·82	1·16	0·96	6·13	0·65	0·12	0·06
Botanic Gardens	26	0·32	1·42	4·35	0·46	1·85	8·40	0·82	0·13	0·04
Richmond Park...	26	0·19	1·32	3·05	1·78	2·24	8·58	1·27	0·13	0·06
Ruchill Park ...	26	0·23	1·27	3·03	0·81	2·29	7·63	1·21	0·11	0·02
South Side Park.	27	0·18	0·77	3·24	0·57	2·69	7·45	1·03	0·22	0·02
Tollcross Park ...	27	0·29	1·70	4·11	1·27	2·54	9·91	1·31	0·22	0·04
Victoria Park ...	27	0·29	1·29	3·88	0·71	1·69	7·86	0·93	0·11	0·03

July 31st, 1918.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash.	Soluble matter. Loss on ignition.	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl)	Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office...	154	0·07	1·54	2·32	3·08	8·00	15·01	2·92	0·87	0·38
Embankment Gardens*	—	—	—	—	—	—	—	—	—	—
Finsbury Park ...	111	0·02	1·44	3·56	4·53	4·53	14·07	2·90	0·68	0·08
Ravenscourt Park	114	0·10	2·77	7·06	3·42	6·84	20·19	2·74	0·68	0·34
Southwark Park...	56	0·24	2·06	9·07	3·89	2·77	18·02	1·50	0·44	0·03
Victoria Park ...	39	0·17	2·13	7·98	2·13	1·75	14·15	0·93	0·23	0·08
Wandsworth Com.	13	—	0·01	0·00	0·58	0·91	1·51	0·36	0·14	0·04
Golden Lane ...	120	0·08	2·48	4·20	1·92	4·31	12·98	2·34	0·72	0·30
Malvern*...	—	—	—	—	—	—	—	—	—	—
Manchester—										
Whitworth Street (garden)	106	—	—	—	—	—	14·30	—	—	—
,, (roof of College)*	—	—	—	—	—	—	—	—	—	—
Newcastle-on-Tyne	93	0·16	5·24	7·35	3·63	11·21	27·61	4·16	0·92	0·14
Rochdale	—	—	—	—	—	—	32·88	—	—	—
St. Helens	83	0·21	1·92	3·44	2·27	4·96	12·80	1·99	1·16	0·16
Southport—										
Hesketh Park ...	103	0·02	0·35	0·47	0·76	5·07	6·67	1·83	0·32	0·06
Woodvale Moss...	96	—	—	—	—	—	7·22	—	—	—
SCOTLAND.										
Coatbridge	65	0·13	1·63	6·27	2·42	4·95	15·40	2·60	0·30	0·21
Glasgow—										
Alexandra Park...	72	0·12	6·58	3·43	1·09	3·13	14·35	1·83	0·24	0·18
Bellahouston Park	76	0·08	2·09	4·31	0·70	2·10	9·28	1·71	0·12	0·01
Blythswood-sq. ...	50	0·09	1·23	3·00	0·52	1·20	6·04	1·11	0·13	0·12
Botanic Gardens	93	0·06	1·71	3·59	1·31	5·59	12·26	2·59	0·22	0·06
Richmond Park...	73	0·19	1·64	5·82	1·62	2·97	12·24	2·09	0·51	0·22
Ruchill Park ...	53	0·08	1·17	3·53	0·39	1·26	6·43	0·99	0·09	0·06
South Side Park..	77	0·06	0·71	2·14	3·67	4·50	11·07	1·94	0·14	0·07
Tollcross Park ...	72	0·08	1·45	5·58	5·12	4·47	16·70	2·32	0·14	0·11
Victoria Park ...	95	0·08	1·79	3·92	1·58	2·87	10·24	2·39	0·33	0·12

* No returns.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9 lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) 1 g. per sq. metre; (*d*) 1/1000 mm. of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables. The analyses of the rain and deposit caught in the gauge at the Meteorological Office are made in THE LANCET Laboratory.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, JULY 28TH.

Ministry of Health: Consultative Councils.

On the motion that the House approve of the Ministry of Health (Consultative Councils) Order, 1919, and the Ministry of Health (Welsh Consultative Council) Order, 1919,

Lord DOWNHAM expressed the opinion that the setting up of the proposed four consultative councils was a costly and cumbersome experiment in government, and one which struck at the root of Ministerial responsibility. There was no precedent for it whatever. If the Ministry of Health was to set up these councils with a large amount of machinery, why should not it be permitted to 10 or 12 other great Departments of State also to do so? He wished to know if any estimate had been formed of the cost of setting up these four councils. He moved an amendment to limit the number of councils to two, one for medical services and the other for national health insurance, and to strike out the proposed councils for local health administration and general health questions respectively, on the ground that they were uncalled for, as the Minister could obtain all the advice he required for the numerous bodies who were engaged day by day in the administration of sanitary law.

Viscount SANDHURST (Lord Chamberlain) said he had done his best on a former occasion to show why, in the opinion of the Government, the proposed consultative councils ought to form a most important part of the Ministry of Health Act. He was not prepared with any estimate of the cost, but it was only proposed to have one secretary and one staff, and to use the present health offices. The idea behind these consultative councils was that everything should not be done from Whitehall. The council on the general health question was hardly less important than the other three councils, and he believed the other three to be most important. To make the Ministry of Health Act a success they must endeavour to get the confidence of the people, and having got it, they must enlist the most sympathetic health knowledge and coöperation of all. He submitted that these councils would supply that, and he appealed to the House to support the Orders now before them.

On a division the amendment was lost by 31 votes to 23, and the motion was then agreed to.

HOUSE OF COMMONS.

WEDNESDAY, JULY 23RD.

Medical Advice for Officers on Leave.

Colonel YATE asked the Secretary for India whether he was aware of the expenses involved in obtaining medical advice in London for officers on leave from India; and whether he could do anything to assist these officers in that respect.—Mr. MONTAGU replied: All Indian Army officers on sick leave in this country during the war have been admitted to the same medical treatment in hospitals or by private practitioners as British Service officers. Through the generous aid of the London School of Tropical Medicine it has also been possible to arrange to send civil and military officers suffering from tropical diseases to the School hospital at the Albert Docks for diagnosis and preliminary treatment. I hope it may be possible to continue this arrangement. It secures to the officer the best advice on his case and as to its treatment. The hospital charges in these cases are borne by the revenues of India.

Service Disability Pensions.

Sir B. FALLE asked the Secretary to the Admiralty if he could make any statement as to the service pensions of men invalided, apart from any award in respect of disability.—Dr. MACNAMARA replied: Under present regulations only a man with fourteen years' service is entitled to a life pension on the service disability scale in addition to any award from the Ministry of Pensions in respect of permanent disablement. The whole question of the service disability side of the award made to the men invalided is now being considered.

Sir B. FALLE: Is it on the new basis?—Dr. MACNAMARA: That is the point, whether the service disability side shall be reassessed to an amount proportionate to the new scale basis, but as to that I can give no undertaking at the moment.

Welsh Board of Health.

Sir DAVID DAVIES asked the Minister of Health when he proposed to appoint the remaining members of the Welsh Board of Health; whether he proposed to give definite powers and duties to the Welsh Board as a corporate body; and whether he would give an assurance that the organisation of his department in Wales would not be proceeded with until the Welsh Board had been fully constituted?—Major ASTOR (Parliamentary Secretary to the Ministry of Health) replied: My right honourable friend cannot yet say how soon any further members will be appointed nor when the whole Board will have been completed. Such powers and duties as may be exercised in Cardiff under Section 5 of the Act will be exercised in manner provided by that Section. The organisation in Cardiff will be developed from time to time in whatever manner the circumstances may render expedient. It would be premature for me to make any forecast in this respect to-day.

THURSDAY, JULY 24TH.

Artificial Limbs for Officers.

Major COHEN asked the Pensions Minister if he would say whether officers who, as the result of their war service, required to wear artificial appliances were required to bear the cost of repair and renewal of these appliances themselves, although in the case of the sailor or soldier the cost was borne by the State.—Sir L. WORTHINGTON-EVANS replied: I am glad to be able to announce that the cost of repairs and renewals of artificial limbs and other appliances will in future for officers, as for men, be borne by the State. The decision which was some time ago arrived at in regard to artificial limbs has already been announced, and it has now been extended to artificial appliances other than limbs. The serving officer must bear the cost of renewals and repairs until retired, but on his retirement my department will undertake such expenses when necessary from fair wear and tear.

Dental Register in Isle of Man.

Mr. SEDDON asked the Minister of Health whether he was aware that dental practitioners in the Isle of Man were on a register separate from that of Great Britain; whether he was aware that gentlemen whose names were on the British register could practise in the Isle of Man but not vice versa; and whether the coming amending Bill to The Dentists Act, 1878, would take cognisance of this position and confer the benefit of registration in Great Britain on men on the register of the Isle of Man, in order to give them equal status to gentlemen on the British register.—Commander EYRES-MONSELL (Treasurer of the Household) replied: The Dentists' Register is now common to the United Kingdom and the Isle of Man. By the Isle of Man Dental Act, 1908, provision was also made for a "supplemental register" of persons in practice in the island on Jan. 1st, 1908, and such persons can only practise locally. As regards the latter part of the honourable Member's question it is premature to say what will happen to persons so situated, but the recommendations on the point contained in the Report of the Dentists' Committee suggesting machinery through which claims might be considered will be carefully considered.

MONDAY, JULY 28TH.

Dental Caries in Children.

Mr. SUGDEN asked the Minister of Health if he would state what steps he was taking to prevent dental caries in children under school attendance age, children in attendance at school, and adults, respectively; and, in view of the prevalence of dental caries, as revealed by recruit examinations, in adult males, whether he would issue instructions to local authorities to institute inquiries and forward recommendations thereon for its elimination.—Dr. ADDISON replied: Adequate provision of dental treatment for the whole population as suggested in the honourable Member's question can only properly be produced as an integral part of that complete scheme of national health services which will be amongst the earliest matters to be considered by the Ministry with the advice of the consultative councils. A prime necessity, however, must be certain improvements in the existing arrangements for dentistry suggested in the Report of the Departmental Committee, which will require legislation in certain respects. In the meantime the provision of dental treatment for mothers and children is being developed by several local authorities under the Regulations of the Ministry of Health and by help of its grants; in several school clinics by and of the Board of Education; and in some areas in connexion with Health Insurance. The importance of the matter is emphasised in all suitable communications from the Ministry to local bodies.

Medical Benefit under National Insurance.

Mr. NEWBOULD asked the Minister of Health if he could state the number of invalided seamen, marines, and soldiers entitled to medical benefit under the National Insurance Acts in England, Scotland, and Wales respectively.—Dr. ADDISON replied: In September, 1917, special arrangements were made as to the provision of medical benefit for men invalided from war services. The approximate number of men admitted to this benefit under these arrangements is 318,000, being 270,000 in England, 28,000 in Scotland, 20,000 in Wales. But there is an additional number of such men who, having commenced to be eligible for medical benefit before September, 1917, are not included in these figures; the number of these is not known, as they are merged in the civil population.

The Physical Condition of Recruits.

Major FARQUHARSON asked the Pensions Minister if it was the case that all the scientific data and documents collected by the Ministry of National Service in regard to the physical condition of recruits of His Majesty's Army had now passed into the possession and custody of his department; and, if so, would he forthwith transfer these documents to the Ministry of Health.—Sir JAMES CRAIG (Parliamentary Secretary to the Ministry of Pensions) replied: The whole of the medical and statistical staff of the Ministry of National Service were tranferred to the Ministry of Pensions on April 1st last. Part of the staff had been for some time engaged on the work of collating and analysing the scientific data and documents to which the honourable Member refers, and it was considered advisable that they should bring the work with them and complete it. My right honourable friend the Minister of Health has throughout approved of this course of action. It is hoped that the results of this work will be published in the autumn. In the meantime any information is at the service of the Ministry of Health.

Vaccination in the Royal Navy.

Mr. JOHN DAVISON asked the First Lord of the Admiralty whether he was aware that Stoker P. O. Arthur Simmons and other men serving on H.M.S. *Culypos* in the Black Sea had been confined to the ship for three months because of their refusal to be vaccinated; whether he was aware that Simmons had already been vaccinated three times whilst in the Navy; whether this punishment was in accordance with the regulations; and whether he would have inquiry made into the matter.—Dr. MACNAMARA (Parliamentary Secretary to the Admiralty) replied: The Admiralty has no information as to the particular case quoted, but the circumstances related in the question are in accordance with the regulations which provide that persons who decline revaccination were not to land in ports where there is danger of contracting small-pox. A virulent type of small-pox is endemic in the Black Sea. The confinement to the ship in such cases is not a punishment, but a necessary precaution to protect both those who decline revaccination and their shipmates.

Trade Marks and Patent Drugs.

Sir AUCKLAND GEDDES (President of the Board of Trade), in moving the second reading of the Trade Marks Bill, said that under the first part of the Bill it was intended to have a list or register of trade marks which had Common Law existence. It was proposed to have a part "B" of the register of trade marks, and it would be much easier for anyone who wished to register such marks to get them on to part "B" than on to part "A." The second part of the Bill had very considerable practical importance. There was a great abuse at the present time in connexion with the use of words as trade marks, and it was to deal with that abuse that the second part of the Bill was designed. They had, for example, the case of drugs which in the past were patent drugs. During the period of their existence the name had become the one practical description of them, and when the name became a trade mark they had got a permanent continuation of the patent protection. There was, for instance, among chemical substances the well-known case of aspirin. It was to deal with the difficulties arising from the use of such names as absolutely blocking names upon other manufacturers of the same chemical substance that the second part of the Bill was brought forward. The second reading of the Bill was agreed to.

TUESDAY, JULY 29TH.

Medical Officers Serving in India.

Mr. CAPE asked the Secretary of State for War whether Royal Army Medical Corps officers in India who contracted to serve for the duration of the war were being detained whilst other medical officers who only signed yearly contracts were to be demobilised first.—Mr. CHURCHILL replied: Every Regular medical officer of the Royal Army Medical Corps who can possibly be spared has been placed under orders for India so as to release temporary commissioned officers who are serving there.

Mr. CAPE asked the Secretary of State for War whether Regular Royal Army Medical Corps officers were being retained at home stations whilst doctors who took temporary commissions were being detained in India and elsewhere at great personal and financial sacrifice.—Mr. CHURCHILL replied: Officers serving under a yearly contract have been sent home from India, as there is no authority to retain them beyond the period of their contract.

Fleet Surgeon Alfred J. Corrie, R.N., has been elected a governor of St. Bartholomew's Hospital, London.

THE Wellcome Historical Medical Museum will be closed for cleaning and redecoration from August 9th until the end of September.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON HOSPITAL MEDICAL COLLEGE, in the Clinical Theatre of the Hospital.

A Course of Clinical Lectures for Advanced Students on Intermittent Blood Infections and their Relation to Certain Common Diseases of the Kidney, Prostate, Testicle, and other Organs will be delivered by Mr. F Kidd:—

WEDNESDAY, August 6th.—4.15 P.M., Lecture I:—Infections of the Kidney: Pyelonephritis and Pyelitis. Clinical Course; Diagnosis: Treatment.

A Special Course of Instruction in the Surgical Dyspepsias will be given by Mr. A. J. Walton:—

FRIDAY.—4.30 P.M., Lecture II.:—The Clinical History Taking of Surgical Dyspepsias.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

DULBERG, JOSEPH, M.D. Würzburg, L.S.A., has been appointed a Medical Referee under the Workmen's Compensation Act for County Court Circuits Nos. 7 and 8.

EVANS, WILLMOTT H., M.D. Lond., F.R.C.S. Eng., Consulting Surgeon to the Royal Free Hospital.

HIGGINS, T. T., F.R.C.S., Surgeon to the Hospital for Sick Children, Great Ormond-street, W.C.

JAMES, Surgeon-Colonel W. C., M.D., Consulting Physician to the Westminster General Dispensary.

NEWSHOLME, H. P., M.D. Oxon., D.P.H., County Medical Officer of Health, North Riding of Yorkshire.

St. Bartholomew's Hospital and College: BALL, W. G., F.R.C.S., and ROBERTS, J. F. R., M.B., F.R.C.S., Demonstrators of Practical Surgery; WATSON, Sir CHARLES G., F.R.C.S., Demonstrator of Operative Surgery; DONALDSON, M., M.D., F.R.C.S., Demonstrator of Midwifery; CUNNINGTON, W. A., Demonstrator of Biology; JOHNSTON, J. H., M.Sc., Demonstrator of Chemistry; HOPWOOD, F. L., D.Sc., Demonstrator of Physics; SHELLSHEAR, J. L., M.B., Ch.M. Sydney, Senior Demonstrator of Anatomy; RAMSAY, R. A., M.C., M.B., GRIFFITHS, H. E., M.B., B.S., and HUME, J. B., M.R.C.S., L.R.C.P., Demonstrators of Anatomy; TREVAN, J., M.B., B.S., Senior Demonstrator of Physiology; DREYER, N. B., and HILTON, R., Demonstrators of Physiology; CANTI, R. G., M.B., B.C., JOEKES, T., M.B., and MURRAY, E. G. D., Demonstrators of Pathology; and SHORE, T. H. G., M.D., B.C., Curator of the Museum.

General Infirmary, Leeds: WATSON, GEORGE W., M.D., F.R.C.P., Honorary Physician; BRAITHWAITE, L. R., M.B. Ch.B., F.R.C.S., Surgeon in Charge of Out-patients; LEE, HARRY, M.B., B.C., F.R.C.S., Honorary Ophthalmic Surgeon; BURROW, J. LE F., M.B., Ch.B., Honorary Assistant Physician.

London (Royal Free Hospital) School of Medicine for Women: KEENE, MARY L., M.B., B.S., Lecturer in Anatomy and Head of the Anatomy Department; EBDEN, J. W., M.B., B.S., ADEL, L., M.B., B.S., HOUNSFIELD, MARY, M.B., B.S., and JOLL, MARY, M.D., B.S., Demonstrators of Anatomy; SPILSBURY, B. H., M.B., Ch.B., Lecturer in Forensic Medicine and Toxicology; SCARBOROUGH, ELEANOR, M.R., B.S., Demonstrator in Pharmacology; ROSS-JOHNSON, M., Nat. Sci. Tripos, Camb., and WOODMAN, D., B.Sc., Demonstrators of Physiology.

Miller General Hospital, Greenwich: JOLL, C. A., M.S., B.Sc. Lond., Surgeon; HINE, M. L., M.D. Lond., F.R.C.S. Eng., Ophthalmic Surgeon.

Victoria Hospital for Children: EVERIDGE, J., F.R.C.S., JOLL, C. A., F.R.C.S., and MARSHALL, C. J., F.R.C.S., Surgeons to Out-patients; GOULDEN, C. B., F.R.C.S., Ophthalmic Surgeon; KAY, VAL, L.D.S., Dental Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: R. J. BRUCE, M.B., Ch.B. Aberd. (Turriff); MALONEY, J. A., (Churchill); DAVIES, H. C., M.B., Ch.B. Glasg. (Nantgaredig); GRIFFITHS, D. H., M.R.C.S., L.R.C.P. Lond. (Cross Hands).

Vacancies.

For further information refer to the advertisement columns.

Bedfordshire Education Committee.—School Dentist. £400.

Birmingham City.—Municipal Bacteriologist. £700.

Birmingham Municipal Antituberculosis Centre.—Sen. Asst. Tuberc. O. £600.

Birmingham, Rubery Hill Asylum and Annexe at Hollymoor.—Med Supt. £1250.

Brighton, Royal Sussex County Hospital.—Sen. H.S. £140.

Cairo, Egyptian Government School of Medicine.—Profe-sors and Lecturers. £E.1000 and £E.600. Also Radiologist and Lect. in Radiology, £E.500, Anæsthetist and Lect. in Anæsthetics, £E.500, and Registrar and Tutor, £E.600.

Carmarthen Mental Hospital.—Second Asst. M.O. £250.

Croydon County Borough.—M.O. £400.

Devonport, Royal Albert Hospital.—Res. H.S. £200.

Dorchester, Dorset County Council Education Committee.—School Dentists. £350.

Downpatrick, Down District Asylum.—Asst. M.O. £250.

East Ham County Borough Education Committee.—School Dentist. £400.

Ely, Isle of Ely County Council.—Asst. Tuberc. O., M.O.H., and School M.O. £450.

Fulham Infirmary, St. Dunstan's-road, W.—Three Asst. M.O.'s. £350 and £300.
George Town Municipality, Penang, Straits Settlements.—Asst. M.O.H. $4200.
Gravesend Hospital.—H.S. £210.
Great Northern Central Hospital, Holloway, London, N.—H.P. £150.
Home Office, Whitehall, S.W.—Med. Inspector of Factories. £500.
Hong Kong Government.—Bact. and Path. £600.
Huddersfield, Bradley Wood Sanatorium for Pulmonary and Surgical Tuberculosis.—Res. M.O. £500.
Huddersfield County Borough Education Authority.—Full-time Dent. Surg. £350.
Hull Education Committee.—Asst. Sch. M.O. £450.
Kettering and District General Hospital.—Res. M.O. £200.
Khartoum, Wellcome Tropical Research Laboratories.—Asst. Bacteriologist. £E.600.
Lancaster County Asylum.—Temp. Asst. M.O. 7 guineas per week.
Leeds Public Dispensary, North-street.—Res. M.O. £200.
Liverpool, Samaritan Hospital for Women, Upper Parliament-street.—Asst. S.'s.
Liverpool School of Tropical Medicine.—Asst. Lect. in Parasitology. £250.
Liverpool University.—Chair of Anatomy. £800.
Macclesfield, Cheshire County Asylum, Parkside.—Locum Tenens. £7 7s. per week.
Maidstone, West Kent General Hospital.—Jun. H.S. £125.
Manchester, Baguley Sanatorium for Tuberculosis.—First, Second, and Third Asst. M.O.'s. £400, £350, and £300 respectively.
Manchester Royal Infirmary.—H.S.'s. £25 for first six months, £50 for second six months.
Newark Hospital and Dispensary.—Res. H.S.
Newcastle upon-Tyne, University of Durham College of Medicine.—Demonstrators of Anatomy and Physiology. £350 to £500 and £300.
Newport Borough Asylum, Cwrleon, Mon.—Asst. M.O. £300.
Northampton County Borough Education Committee.—Female Asst. School M.O. £350.
Nottingham, Notts Education Committee.—Asst. School M.O. £425.
Peckham House, 112, Peckham-road, S.E.—Sen. Asst. M.O. £400.
Poplar Hospital for Accidents, Poplar, E.—Sen. Res. M.O. £200.
Rainhill, near Liverpool, County Asylum.—Temp. Asst. M.O. 7 gs. p.w.
Rochester, Kent St. Barthol·mew's Hospital.—Jun. Res. M.O. £150.
Royal Chest Hospital, City-road, E.C.—Res. M.O. £200.
St. Mary's Hospital Medical School, Paddington, W.—Lecturer on Chemistry. £300.
St. Mary's Hospital for Women and Children, Plaistow, E.—Dent. S. £50.
St. Marylebone Infirmary, Rackham-street, W.—Third Asst. M.O. £200.
Salford Royal Hospital.—Hon. P. and Hon. Asst. P.
Serbia Hospital.—Surgeon.
Seychelles Government.—Asst. M.O. and Visiting Magistrate. Rs.5000.
Sheffield Royal Infirmary.—Asst. H.P. £150.
Taunton, Somerset and Bath Asylum, Cotford.—Asst. M.O. £300.
West African Medical Staff.—Number of appointments. £400.
Westminster Hospital, Broad Sanctuary, S.W.—H.S.
Weymouth, Princess Christian Hospital.—H.S. £200.
Wigan Infirmary.—Jun. H.S. £225.
Willesden Urban District Council.—Asst. M.O.'s. £550 to £650.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Beith and Crosshills.

Births, Marriages, and Deaths.

BIRTHS.

ANDERSON.—On July 23rd, at Yealm Cottage, Loughton, Essex, the wife of Dr. A. W. Anderson, Ogmore Vale, Glam., of a daughter.
COWAN.—On July 24th, at Thetford, the wife of Geoffrey Cowan, M.D., of a daughter.
DOWNS.—On July 22nd, at "Palmers," Great Marlow, Bucks, the wife of Dr. G. E. Downs, of a son.
DUNLOP.—On July 22nd, at Conyers House, Newcastle-on-Tyne, the wife of E. Craig Dunlop, M.B., B.S., of a daughter.
KEMP.—On July 24th, at Caversham, Lemsford-road, St. Albans, the wife of C. Gordon Kemp, M.D., of a daughter.
WILLAN.—On July 25th, 1919, at 23, Claremont-place, Newcastle-upon-Tyne, to Dorothy (*née* Shawyer), wife of R. J. Willan, M.V.O., F.R.C.S., a daughter.

MARRIAGES.

BATTEN—TURNBULL.—On July 23rd, at Essex Church, Notting-hill Gate, W., Captain Lindsey Willett Batten, R.A.M.C., to Ellen Mary, elder daughter of Dr. and Mrs. G. Lindsay Turnbull, of Ladbroke-square, W.
EDWARDS—BIRD.—On June 11th, at All Saints' Church, Srinagar, Kashmir, the Hon. Major-General W. R. Edwards, C.B., C.M.G., K.H.P., I.M.S., Director-General, Indian Medical Service, to Nell, widow of Lieutenant-Colonel R. Bird, C.I.E., M.V.O., I.M.S., and daughter of the late Lieutenant-Colonel R. Dewar, R.A.
FARQUHARSON—BANES.—On July 16th, at the Church of St. Michael and All Angels, Southampton, Donald Charles Farquharson, M.R.C.S., L.R.C.P., to Loveday S. Banes, M.B., B.S. Lond.
WOODHOUSE—FERGUSON.—On July 24th, at St. Peter's, Cranley-gardens, Kensington, Sydney C. Woodhouse, M.B. Lond., M.R.C.S. Eng., Temporary Surgeon Lieutenant, R.N., to Erica, younger daughter of the late Donald and of Mrs. Ferguson, of Croydon, formerly of Colombo, Ceylon.

DEATHS.

HUBBARD.—On July 23rd, in London, Daniel Lovett Hubbard, M.B., B.S., of Bordighera, aged 59 years.
POCOCK.—On July 23rd, at Oxford-gardens, Frederick Ernest Pocock, M.D., M.R.C.S., late of "The Limes," St. Mark's-road, North Kensington, aged 67.
READ.—On July 23rd, at Downshire-hill, Hampstead, Charles Read, M.D. Lond., aged 81.
YOUNGER.—On July 24th, at 2, Mecklenburgh-square, W.C. 1, Edward George Younger, M.D., M.R.C.P., aged 69 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ARNOLD, EDWARD, London.
Diseases of Women. By Ten Teachers under the direction of Comyns Berkeley, M.C. Cantab. Pp. 650. 30*s*.

BAILLIÈRE, TINDALL, AND COX, London.
Aids to Ophthalmology. By N. Bishop Harman, M.B., F.R.C.S. 6th ed. Pp. 226. 3*s*. 6*d*.
Manual of Anatomy. By the late A. M. Buchanan, M.D. Edited by a Committee of Anatomists in London. 4th ed. Pp. xii. + 1743. 30*s*.

BALE, JOHN, SONS, AND DANIELSSON, London.
The Urethroscope in the Diagnosis and Treatment of Urethritis. By Major N. P. L. Lumb, R.A.M.C. (T.C.). Pp. 52. 10*s*. 6*d*.
Eugenics and Environment. By Prof. C. Lloyd Morgan, F.R.S. Pp. 82. 2*s*.
The Problem of Sex Diseases. By A. Corbett-Smith. 2nd ed. Pp. 108. 2*s*. 6*d*.

CASSELL AND CO., London.
The Welfare of the Expectant Mother. By Mary Scharlieb, C.B.E., M.D. Pp. 152. 5*s*.

CHURCHILL, J. AND A., London.
Volumetric Analysis. By C. H. Hampshire, B.Sc. Lond. 2nd ed. Pp. 128. 5*s*.

DORNAN, W. J., Philadelphia.
Transactions of the American Gynæcological Society. Vol. XLIII. (1918). Pp. 480.
Transactions of the Southern Surgical Association. Vol. XXX. (1917). Edited by H. A. Royster, M.D. Pp. 404.

FROWDE, H., AND HODDER & STOUGHTON, London.
Menders of the Maimed. By Arthur Keith, M.D. Pp. 336. 16*s*.
Venereal Diseases: A Practical Handbook for Students. By C. H. Browning, M.D., and David Watson, M.B. With Introduction by Sir John Bland-Sutton. Pp. 336. 16*s*.

GALE AND POLDEN, London.
Ten Lectures on Field Sanitation. By C. B. Moss Blundell, M.D. Pp. 134. 5*s*.

HEINEMANN, W., London.
Practitioner's Manual of Venereal Diseases, with Methods of Diagnosis and Treatment. By A. C. Magian, M.D. Pp. 215. 10*s*. 6*d*.

LEA AND FEBIGER, Philadelphia and New York.
Human Infection Carriers. By Charles E. Simon, M.D. Pp. 250.

LEWIS, H. K., London.
Auto-Erotic Phenomena in Adolescence. By K. Menzies. With a foreword by Dr. Ernest Jones. Pp. 88. 4*s*. 6*d*.
Notes on Galvanism and Faradism. By E. M. Magill. 2nd ed. Pp. 224. 6*s*.

LONGMANS, GREEN, AND CO., London and University Press, Manchester.
Shell Shock and its Lessons. By Prof. G. E. Smith, M.D., and T. H. Pear, B.Sc. 2nd ed. Pp. 135. Cheap edition, 1*s*. 6*d*.

Communications, Letters, &c., to the Editor have been received from—

A.—Mr. W. Appleyard, Bradford.
B.—Baby Saving League of British Guiana; Dr. B. G. M. Baskett, Rayleigh; Mr. G. Buckle, Edinburgh; Surg.-Comdr. W. Bastian, R.N.; Dr. W. Langdon Brown, Lond.
C.—Dr. E. F. Cyriax, Lond.; Dr. R. H. Cole, Lond.; Mr. W. Cowdery, Lond.; Dr. M. Cosgrave, Dublin; Fleet-Surg. A. T. Corrie, R.N.; Colonial Office, Lond.
D.—Lieut.-Col. J. F. Donegan, C.B., Lond.; Mr. L. J. Devota, Kota Bharu, Kelantan; Mr. H. Dickinson, Lond.; Dr. V. Dickinson, Lond.
E.—Dr. W. A. Evans, Keighley.
F.—Dr. C. Flandin, Paris; Dr. J. N. F. Fergusson, Brighton; Mr. P. Franklin, Lond.; Factories, Chief Inspector of, Lond.
G.—Mr. J. J. Grace, Lond.; Dr. H. O. Gunewardene, Lond.; Lieut.-Col. E. Goodall, R.A.M.C.; Dr. A. G. Gibson, Oxford.
H.—Dr. H. Head, Lond.; Lieut.-Col. C. L. Hunter; Mr. R. W. Hatt, Bath.
I.—Insurance Committee for the County of London; Industrial Fatigue Research Board, Lond.
J.—Dr. F. Wood Jones, Lond.
K.—Dr. A. M. Kennedy, Glasgow.
L.—London Hospital Medical College, Sec. of; Miss M. M. Lee, Lond.; London School of Tropical Medicine, Sec. of.
M.—Mr. S. R. Meaker, Esher; Mrs. M. McConnel, Petersfield; "Member of Board"; Ministry of Health, Lond.
N.—*Nursing Times*, Lond., Editor of; Miss O. Nethersole, Lond.; Dr. A. J. Nyulassy, Perth; National Food Reform Association, Lond.; National League for Health, Maternity, and Child Welfare, Lond.; Dr. R. H. Norman, Harpenden.
P.—Dr. B. Pierce, York; Col. A. G. Phear, A.M.S., Lond.; Dr. S. Porterfield, Widnes.
R.—Dr. J. D. Rolleston, Lond.; Rockefeller Institute for Medical Research, Lond.; Royal Faculty of Physicians and Surgeons, Glasgow; Dr. W. C. Rivers, Alton.
S.—Société de Biologie, Paris; Mr. R. E. Smith, Barry; Dr. E. B. Sherlock, Lond.; Summer School of Civics and Eugenics, Lond.; Save the Children Fund, Lond.; Mr. F. B. Shawe, Boxmoor; Prof. W. Stirling, Manchester; Dr. H. Sharman, Lond.; Selborne Society, Lond., Chairman of; Mr. F. St. J. Steaman, Lond.; Dr. A. G. Shera, Eastbourne; Dr. D. M. Shaw, Lond.
T.—Dr. H. H. Thomson, Hertford; Dr. A. H. Thompson, Lond.; Dr. A. H. Turner, Meols; Dr. H. H. Tooth, C.B., C.M.G., Lond.
U.—University of London, Sec. to the Senate; University of Sheffield, Registrar of.
W.—Dr. J. D. Wynne, Norwich; Mrs. M. White, Banteer; Mr. J. Wright, Pleasantville; Dr. G. Ward, Sevenoaks; Wellcome Historical Medical Museum, Lond.; Dr. A. C. Wilson, Lond.; Dr. S. A. K. Wilson, Lond.
Z.—Dr. S. C. Zavitzianos, Corfu.

Communications relating to editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, London, W.C. 2.

Dr. MacDowel Cosgrave, 5, Gardiner-row, Dublin, will be grateful for book-plates of medical men, and will gladly send his own in exchange.

Notes, Short Comments, and Answers to Correspondents.

MUSCLE TRAINING IN RECLAIMING CRIPPLES.

BY JAMES PATTERSON, M.D.,
CAPTAIN, CANADIAN ARMY MEDICAL CORPS; OFFICER IN CHARGE, MASSAGE, HYDRO- AND ELECTRO-THERAPY, AND REMEDIAL GYMNASIUM, GRANVILLE CANADIAN SPECIAL HOSPITAL, BUXTON, DERBYSHIRE.

THE ideas underlying this paper may be expressed thus: success in restoring function demands a common-sense application of a simple knowledge of physics, anatomy, and psychology. Given that, and sufficient help, muscle training will play an increasingly satisfactory rôle in the reclaiming of crippled men. And the greatest efficiency will be attained under unity of direction. The hydro-therapy, massage, electro-therapy, gymnasium games and remedial workshops must form one department with coördinate effort to that end.

Physical Remedies.

Heat, whether in the form of the eau courante baths, whirlpool baths, hot packs, or the radiant-heat box, makes possible a greater range of motion, either passively or voluntarily. Next comes massage and passive movement, the application of which is universally conceded to be efficacious. Great care is necessary in applying this remedial agent. It must be done without pain until the operator has the absolute psychic and muscular coöperation of the patients. Then it is possible, and often desirable, to push passive movements to the point of causing distress. But unless this happy coördinate effort between masseur and patient obtains, we find that although the patient may be willing to suffer pain in order to secure movement, the muscles controlling the part affected are in a state of rebellion, the one set acting absolutely independently of his consciousness against the set from which we desire to obtain action. But with massage properly given this muscle terror is entirely overcome.

As to electro-therapy the galvanic current has a use in helping to maintain function in muscles to which the nerve-supply is destroyed. The faradic current has tremendous helpful influence in building up weakened muscles that have been out of use for a period, from any cause whatever, but to which the nerve is intact. And we cannot neglect what may be termed a psychic lameness—that is, a habit of thought that the affected part is not usable.

In muscle training itself two elementary facts must be noted. The first is, we must put the muscle group we are working on in such a position that it does not contend against the force of gravity. The other is that a most useful aid comes by having the patient perform the motion with the good limb that he is being taught to perform with the crippled one.

Our method of attack, then, entails a knowledge of the subjects mentioned. The war has forced on the profession the value of all these physical remedies, and each one has its use, its limit, and its definite place. To secure the best results the hospital should have a department of physical remedies under one head, and with plenty of help, alike of fully trained medical officers, competent masseurs, and remedial instructors. These medical officers and trained assistants must know not only massage, but hydro- and electro-therapy and physical training, because only by the most close coöperation between the workers in these very closely allied lines can we hope to obtain rapid and effective results. The sooner expert treatment of this sort is established the better, thus preventing adhesions forming. However, we must at present deal with the cases that come to us, where there may be more or less firm fixation between muscle planes, tendons, and tendon sheaths, and deformities due to contractures. [A rough ground-plan of a treatment department, suitable to take the cases from a hospital of about 1400 beds, was here put forward, showing a logical arrangement of heat, massage, and electro-therapy.] Continuous with this should be the gymnasium, into which the patient may be at once taken to carry on his treatment, or from which he may be sent after his efforts there. The building should be large enough, light enough, and warm enough to be comfortable, with little and simple apparatus, and plenty of room for games.

Metatarsalgia.

We now come to some special problems. The first of these forms too large a percentage of disabilities, and is preventable—namely, metatarsalgia. Primarily the term refers to the condition known as Morton's disease, but here we must group not only the metatarsalgias, but also the deformities of the anterior part of the foot, bunions, hammer toes, and claw feet. These conditions have, as a most notable contributory cause, the wearing of boots too short and improperly shaped. The hampering of the toes causes a distortion of their joints, particularly a partial luxation of the proximal phalanges on the metatarsals.

For cure we must have first of all boots of the proper size, which is three sizes longer than the foot. The foot being measured for a boot is lifted from the ground. When a person puts his full weight on his foot it spreads antero-posteriorly from one to two shoe lengths, sometimes more. Again, we are placing two curved surfaces together; when the foot bends in the boot it is the inner of the two curved surfaces. The sole of the boot must be sufficiently long to allow of this curving of the foot without distorting the inner curve. A man working in this department must provide himself with a shoemaker's foot measure, and be ready to explain why such a sized boot is worn. A size is three-eighths of an inch. But how much better it would be if each non-commissioned officer in charge of the boot stores had such an instrument and issued proper sized boots to each soldier.

Next to consider is the shape of the boot. It must be wide at the toe to allow the toes to come straight from their respective metatarsal bones, and the cap must be firm and extend sufficiently far back to prevent wrinkling of the upper from pressing on the already deformed toes. Besides that it must have a snug-fitting heel seat, and grasp the waist of the foot firmly, widening forward to allow the metatarsals to spread and the toes to come straight. Given this, a bar put across the sole, as recommended by Sir Robert Jones, is of inestimable value. Other men have used successfully an adhesive strap around the foot, with or without a pad of felt to lift the transverse arch, and Goldthwaite's figure-of-8 strap has its sphere of usefulness. For the more stubborn cases a sandal, cut to allow of the toes assuming their correct position, with a bar behind the metatarsal heads and with adjustable straps or tapes to pull the deformed toes into their proper places, has been most effective.

These things are palliative, and we must not only use them but re-educate the intrinsic muscles of the feet so as to obtain full and strong action at the metatarso-phalangeal joints. The set of drills adopted for this purpose can be drawn up by anyone with a knowledge of the muscles involved. A bar of wood works well, curved to lift the transverse arch, and perforated for a strap or a heavy cord, so that when the patient adjusts this behind the metatarsal heads and pulls on the cord he has a counter force on which to work at obtaining flexion at the metatarsal phalangeal joints. The difficulty that patients tend to flex the inter-phalangeal joints must be overcome by supervision. Other exercises are drills in abduction and adduction of the toes, and here, again, the game idea is the most satisfactory aid. Patients can early begin to pick up marbles and golf balls and regain prehensile power; after that games can be devised.

Flat-foot.

In flat feet the longitudinal outer arch rarely gives trouble, but the inner, longer, and more springy arch frequently results in casualties, and it is mainly the tarsal bones and the muscles and ligaments that hold them in place with which we have to deal. It is on the tibialis posterior that we mainly depend for cure. The symptoms of flat-foot are numerous, and the examination is not always satisfactory. One gets all the grades from the beginning with only vague pains, to the most pronounced luxation of the tarsus, with marked deformity and absolute rigidity. In the early stages we can be pretty sure of our ground if we keep in mind the position of attachment of the tibialis muscle, its action, and the relief or increase of pain on pressure along it, and along the inner longitudinal arch when we invert or evert the foot. One very characteristic place for pain to be obtained by this manœuvre is where the belly of the muscle changes to the tendon.

Any of the various methods of treatment succeeded more or less: moulding over a triangular block followed by plaster-of-Paris fixation; plates; alteration of the boots by advancing the inner side of the heel; and raising the inner side of the heel and sole. Relief may also be obtained by use of adhesive plaster strapping and corrected boots. But unless we develop and strengthen the tibialis posterior muscle we do not obtain a permanent cure. The first thing to recognise in weakness of the tibial muscles is the concomitant contracture of their opponents, the peroneals; and with the weakening of the ligaments on the inner side there is a corresponding contracture of the ligaments and fibrous tissues on the outer side of the tarsus. In order to get a coördinate relaxation of the muscles in question it is necessary to re-establish tone in the muscles that have lost their power. One very effective means that we use is having the patients walk on an angled board, the two boards being joined at an angle of 45°. With that we have a series of drills in ankle rocking, also some steps of the sailor's hornpipe. Other dances can be used as strength increases. When one considers the attachments of the muscles one can devise a variety of movements.

It is essential that the patient stand and walk, and do all his exercises with the feet parallel and 5 inches apart. This gives an even pull for all the muscles, and if persisted in will, with other measures, cure any case of acquired flat-foot. The usual position of attention, with the feet at an angle of 45°, gives the peroneal group advantage over the tibial group and tends to produce flat-foot.

Internal Derangements of the Knee.

Another special problem is the internal derangements of the knee, of the internal lateral ligaments, and dislocation of the internal semilunar cartilage; they are most unsatisfactory, causing recurring disability to the patient and an enormous loss of time to the army. These injuries always occur as the result of an inward twist to the knee when it is partially flexed and the foot turned out. When we consider the anatomy of the knee-joint it is not strange that the majority of our injuries are to the inner lateral ligaments and the inner semilunar cartilages. It is the weaker part of the joint.

On examining a knee of this sort we observe, whether there be swelling or not, tremendous atrophy of the vastus internus. In the early stages heat and massage play a part in relieving pain and swelling, but perhaps faradic stimulation to the vastus internus is the most important physical remedy in restoring tone. However, unless this electric treatment is followed by muscle training we do not attain our end. With the intelligent coöperation of the patient it is possible to get results without either massage or electrical treatment. A combination of all, however, gives best results.

One of the earliest exercises to develop this muscle may be termed "knee-rolling." This can be done in the early stage when it is not advisable to have the patient bear weight on the joint, by having him sit so that the heel touches the floor, and with the hip of the affected side nearly free from the bench. Here he begins describing circles with the knee, either inward or outward, and the instructor sees that he gets the proper contracture of the vastus internus muscle. The straighter the leg the more action is got in that muscle, but long before he can get complete extension contractions occur.

But knee-rolling is not sufficient in itself. Frequently a lift on the inner side of the heel and sole is of decided advantage. Far beyond the need of this, however, is the insistent observance of the placing of the feet parallel and 5 inches apart in all walking, standing, or drilling. The double knee bend is bad in internal derangement of the knee, and has resulted more than once in dislocation of the semilunar cartilage. The stronger position of the knee with the feet parallel and 5 inches apart over that of the usual position of attention can easily be felt in one's own joints. For these reasons and because of the very notable improvement and not infrequent cures obtained, we consider it essential in all remedial muscle training that patients stand and move with the feet parallel and 5 inches apart. Were this adopted universally in the physical training, both in the army and in schools, it would very much reduce the casualties from sprained knees and also flat feet.

Of great importance is the manner in which the exercises are given. Individual drill is impracticable, so cases are arranged in classes, which will as nearly as possible group similar disabilities. These classes are named from the parts to which most of our effort is directed—i.e., shoulder, elbow, wrist and hand, thigh, leg, foot, back, special, and general or Swedish drill. The leg class includes flat-foot cases. The special class is devoted to cases that do not fit in the others, or need individual attention, and also to stump cases learning to walk on peg legs. To these classes the patient is sent, as his progress in the massage and electro-therapy departments indicates.

Psychic lameness is a tremendous factor. The closer one is to the bed the more simple and gentle must the commands for exercises be in order to restore coördinate movement. The reason is obvious. When function has been eliminated for any period of time it takes some mental training before the patient can hope to get any muscular action, consequently the commands given should be given distinctly, and should call for very simple movements. In a hospital where the patients come almost directly from the bed sharp commands and complicated movements have a distinctly deleterious effect, and this is particularly true in neurasthenics, hysterics, and shell shock cases.

When the patient is advanced to a reasonable stage the next step is to introduce him to outdoor games. Any game with a ball seems to take with the Anglo-Saxon, and the element of competition leads to many involuntary efforts, often with surprisingly beneficial results. As soon as possible one must get away from treating the injured part, and make the patient feel that he need no longer focus his attention on his disability. For example, much can be done for upper extremity injuries by skipping-rope dances.

Vocational training has its sphere, but that is not in our province to discuss now. Workshops have a potent part to play. The effectiveness of that part, however, depends on the creative interest evoked in the patient by the work he *chooses*, and can in no way be measured by marketable value or usefulness. If the result of the patient's activity be useable or saleable so much the better. That idea can often be instilled to incite interest. The workshops should be equipped simply, with reasonable expenditure, as to material and tools—all hand and foot power—and should offer as varied activities as can be arranged. An effort to combine the treatment shops with splint or hospital requisite factories is futile, a failure either way.

For measuring progress, complicated apparatus is a distinct disadvantage in dealing with large numbers. With the simplest goniometer one can get a very satisfactory idea of progress in the movement of joints. A statement of how far the patient can travel on a Ling beam or parallel bars, or how often he can "chin himself," is an accurate enough index of the strength in arm cases; while a march over a measured route, with notations of where the patients drop out, serves in leg cases. And in order to co-relate the work done in hospitals with later progress a note of weekly examinations should be made by the medical officer in charge of the treatment department—i.e., massage, electro-therapy, and gymnasium—as to improvement or lack of improvement. This record should follow the patient up, so as to save duplication of effort.

THE CONVERTED ARMY HUT.

THE Disposal Board of the Ministry of Munitions have erected on the Horse Guards Parade, St. James Park, London, S.W., a 60 ft. × 15 ft. army hut which has been converted into a bungalow. As remodelled, the hut comprises a living-room 20 ft. × 15 ft.; three bedrooms, one 15 ft. × 10 ft., and two others 10 ft. by 10 ft., the height of the rooms being about 7 ft. 9 in. There are also a scullery, larder, bath, w.c., and coal house. The hut is lined with asbestos filled in with coke-breeze. A cooking range, stoves for the bedrooms, and an 18-gallon farm boiler are provided. The price of the hut unconverted is £100, the cost of turning it into a dwelling being approximately £300, whilst the furnishing, as carried out by Messrs. Heal and Sons, of Tottenham Court-road, which includes furniture, linoleum, rush mats, curtains, toilet ware, table ware for six people, fireproof kitchen ware, and bedding costs about £325. The life of a hut is estimated at from 15 to 20 years. The lighting and ventilating arrangements are good, the upper halves of the 12 windows being arranged as fanlights. The conversion of these huts may help towards the solution of the house famine, though the price, reasonable enough, is none the less too high for the small man desiring to own his home. Moreover, while the life of the hut is stated to be 15 years or more—and this need not be challenged—the premises are liable to supervision by local authorities at the expiration of a five years' licence.

TRAVELLING HEALTH EXHIBITIONS.

THE National Union of Women has long made the travelling child welfare exhibition into a fine art as a method of public instruction, and the National Association for Combating Tuberculosis has made similar if sporadic efforts in popularising its own activities. At a recent meeting of the Medical Council of the People's League of Health, held under the chairmanship of Sir G. Sims Woodhead, the honorary organiser, Miss Olga Nethersole, outlined her scheme for public travelling exhibitions as one channel to be employed by the League for the dissemination of knowledge regarding health. The exhibitions would cover the whole field of physical, mental, and moral health, with sections, such as tuberculosis, food, housing, waste, teeth, eyes, parentage, hygiene and respiration, child welfare, venereal disease, crime, alcohol, physical education and gymnastics. The scheme was adopted on the understanding that other associations should be invited to coöperate with the League of Health in the arrangement of the exhibitions.

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